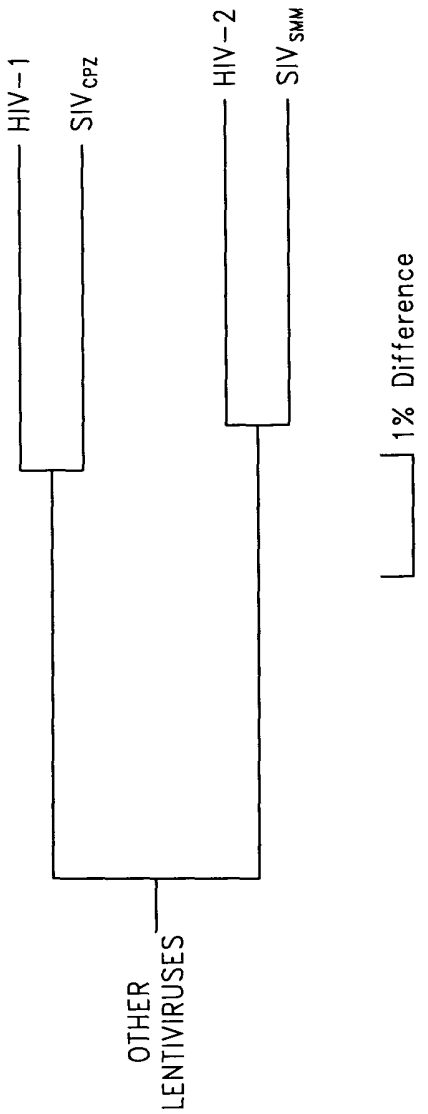

FIG. 1

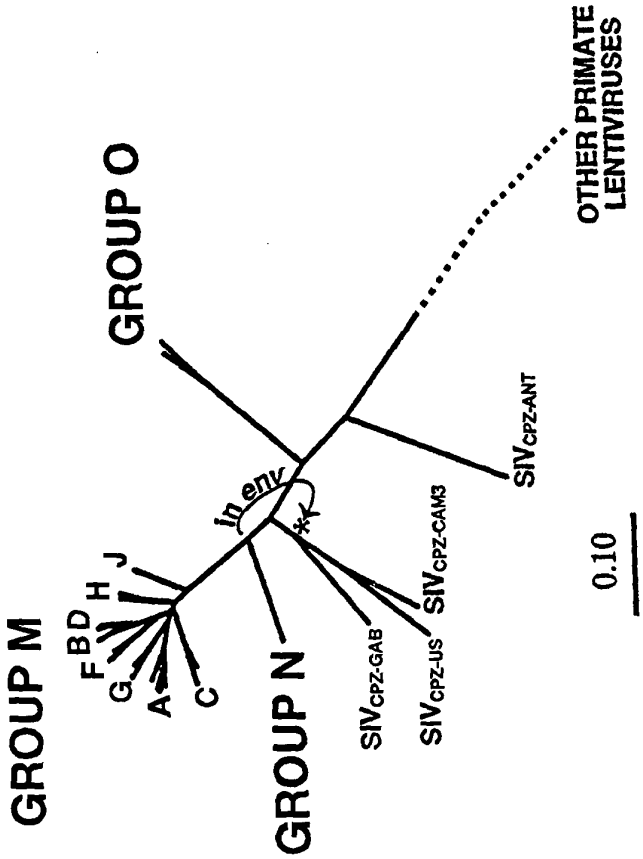
GROUP M
A
B
C
D
F
G
H
J
GROUP N
GROUP O
OTHER PRIMATE LENTIVIRUSES
SIVCPZ-ANT
SIVCPZ-CAM3
SIVCPZ-US
SIVCPZ-GAB
in env
0.10

FIG. 2

Chemokine coreceptor used	PBMC replication	Macrophage replication	T-cell-line replication	REplicative phenotype	Syncytium-inducing phenotype
X4	+	-	+	Rapid/high	++
R5	+	+	-	Slow/low	-
R5/X4	+	+	+	Rapid/high	+

FIG. 3

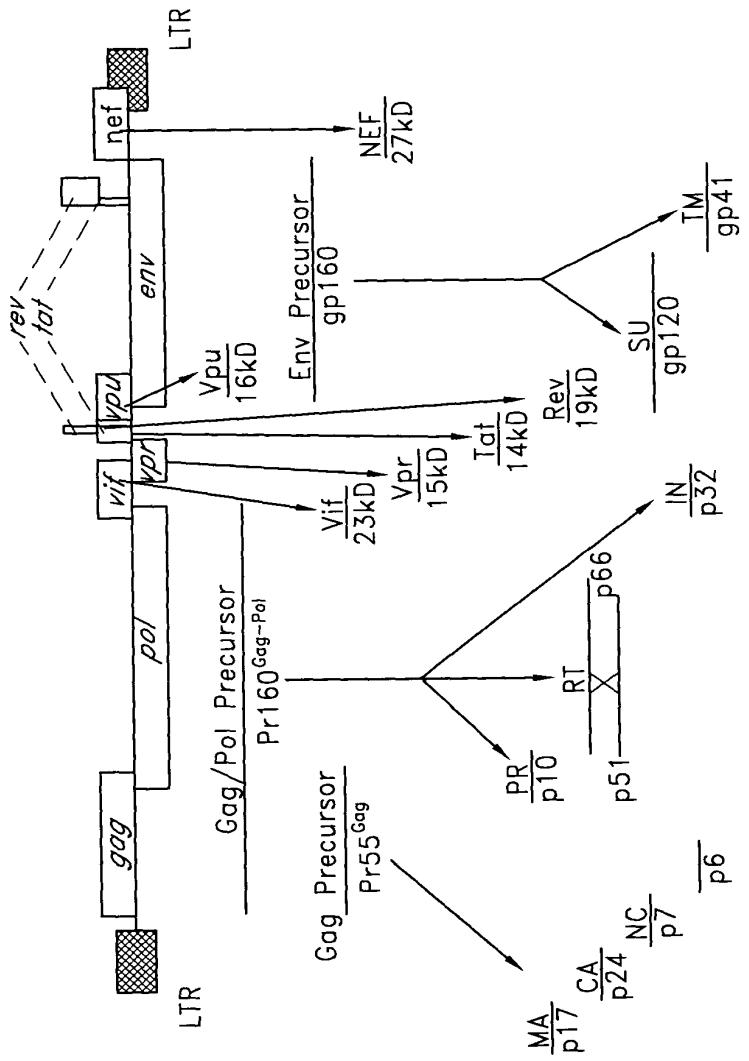
LTR
nef
NEF 27kD
env
rev
tat
Env Precursor gp160
TM gp41
SU gp120
Vpu 16kD
vpu
Rev 19kD
Tat 14kD
vpr
vif
Vif 23kD
Vpr 15kD
pol
Gag/Pol Precursor Pr160Gag-Pol
IN p32
RT
p66
PR p10
p51
gag
Gag Precursor Pr55Gag
MA p17
CA p24
NC p7
p6
LTR

FIG. 4

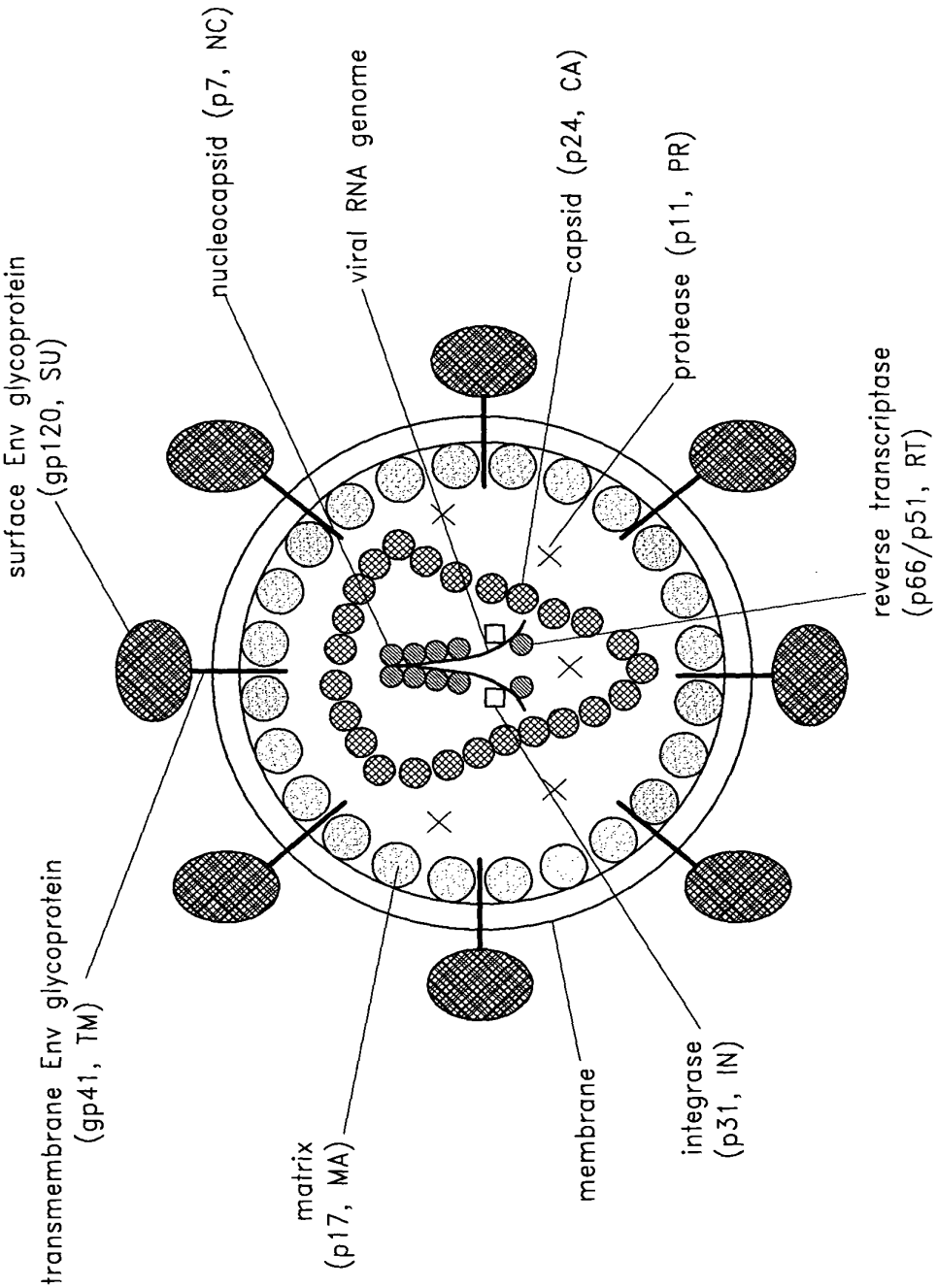
surface Env glycoprotein (gp120, SU)
nucleocapsid (p7, NC)
viral RNA genome
capsid (p24, CA)
protease (p11, PR)
reverse transcriptase (p66/p51, RT)
transmembrane Env glycoprotein (gp41, TM)
matrix (p17, MA)
membrane
integrase (p31, IN)

FIG. 5

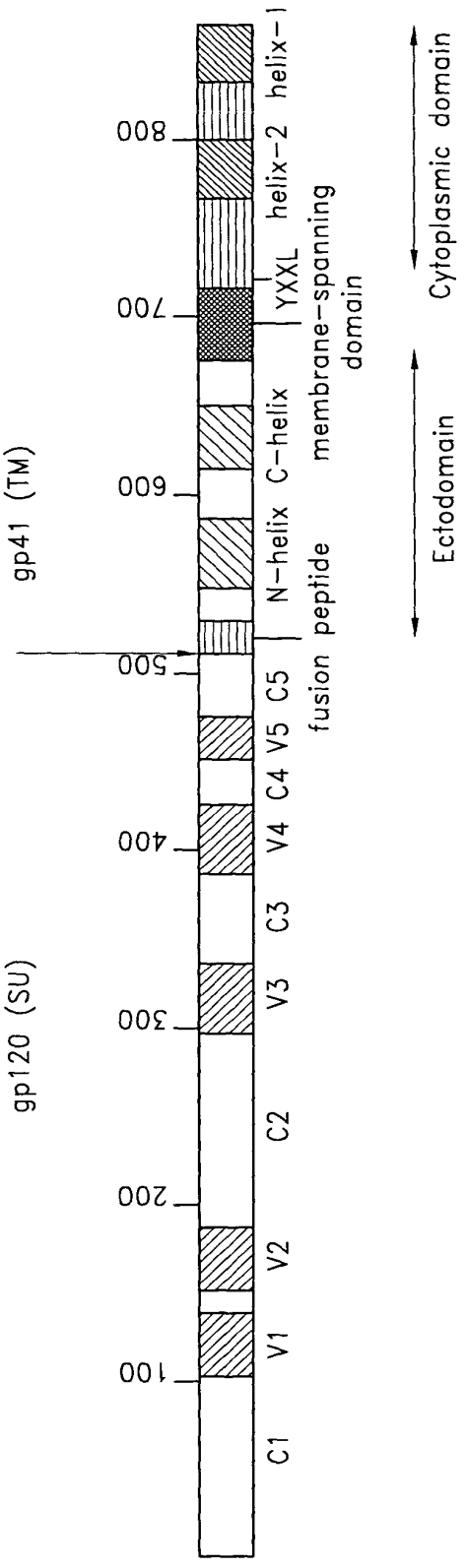
gp120 (SU)
gp41 (TM)
100
200
300
400
500
600
700
800
C1
V1
V2
C2
V3
C3
V4
C4
V5
C5
fusion peptide
N-helix
C-helix
membrane-spanning domain
YXXL
helix-2
helix-1
Ectodomain
Cytoplasmic domain

FIG. 6

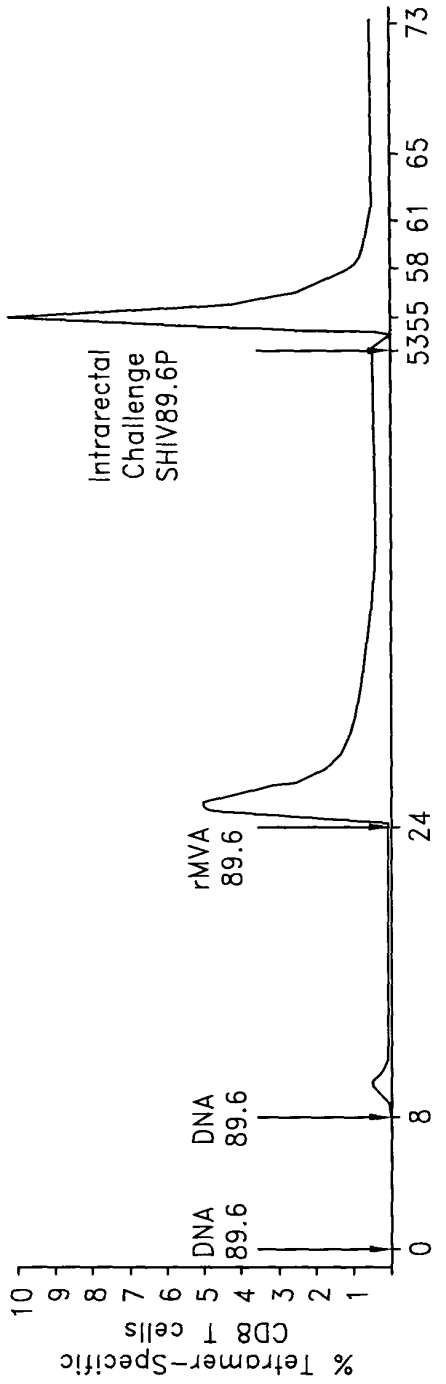
% Tetramer-Specific CD8 T cells
10
9
8
7
6
5
4
3
2
1
DNA 89.6
DNA 89.6
rMVA 89.6
Intrarectal Challenge SHIV89.6P
0
8
24
53
55
58
61
65
73

FIG. 7A

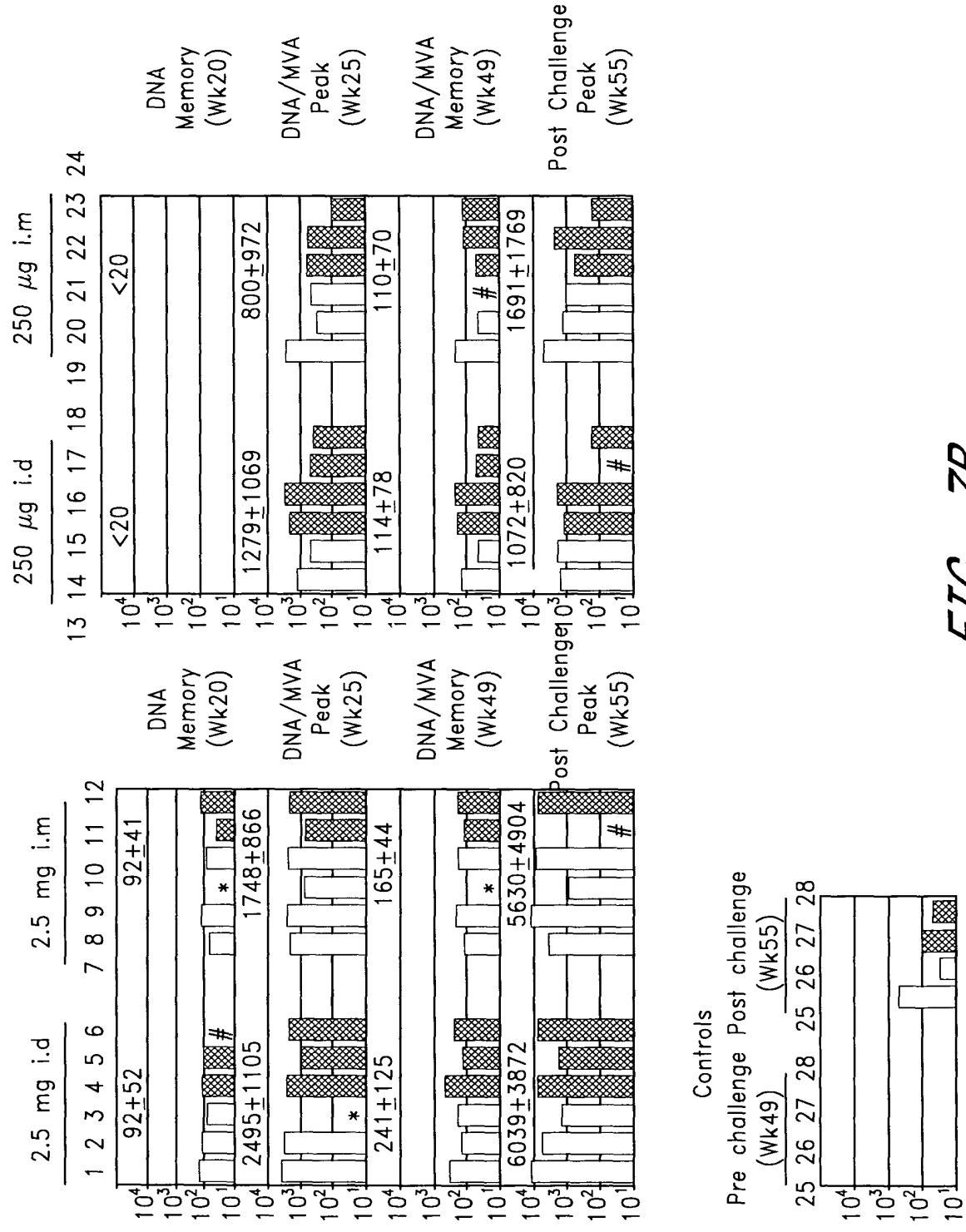
2.5 mg i.d
2.5 mg i.m
250 μg i.d
250 μg i.m
DNA Memory (Wk20)
DNA/MVA Peak (Wk25)
DNA/MVA Memory (Wk49)
Post Challenge Peak (Wk55)
92±52
92±41
2495±1105
1748±866
241±125
165±44
6039±3872
5630±4904
<20
<20
1279±1069
800±972
114±78
110±70
1072±820
1691±1769
Controls
Pre challenge (Wk49)
Post challenge (Wk55)
Gag-specific IFN-γ ELISPOTS per million PBMC

FIG. 7B

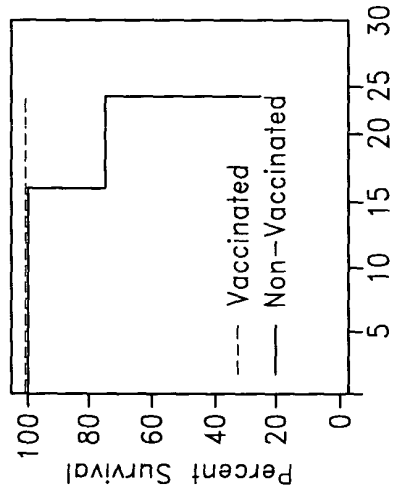

FIG. 8C

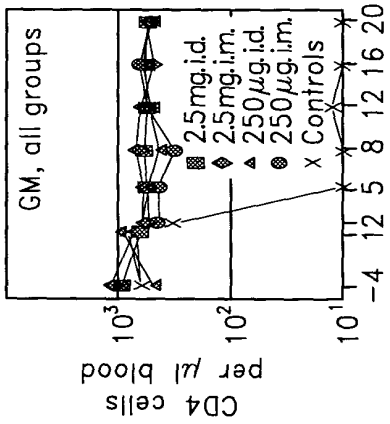

FIG. 8B

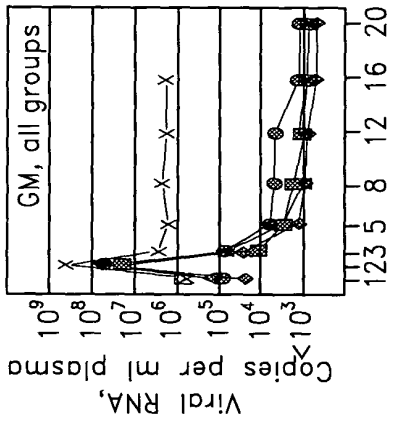

FIG. 8A

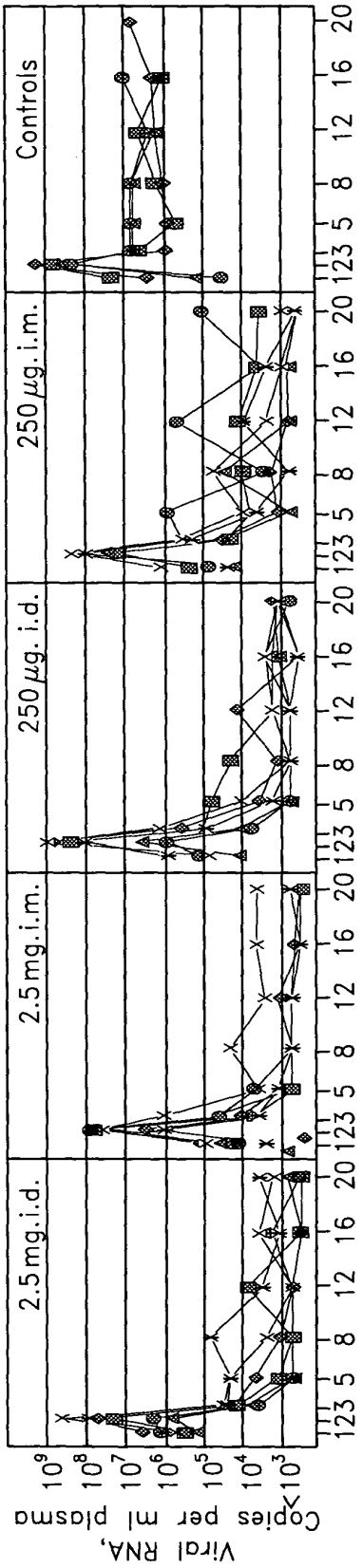
Controls
250 μg. i.m.
250 μg. i.d.
2.5 mg. i.m.
2.5 mg. i.d.
Viral RNA, Copies per ml plasma
10^9
10^8
10^7
10^6
10^5
10^4
10^3
<
1 2 3 5 8 12 16 20

FIG. 8D

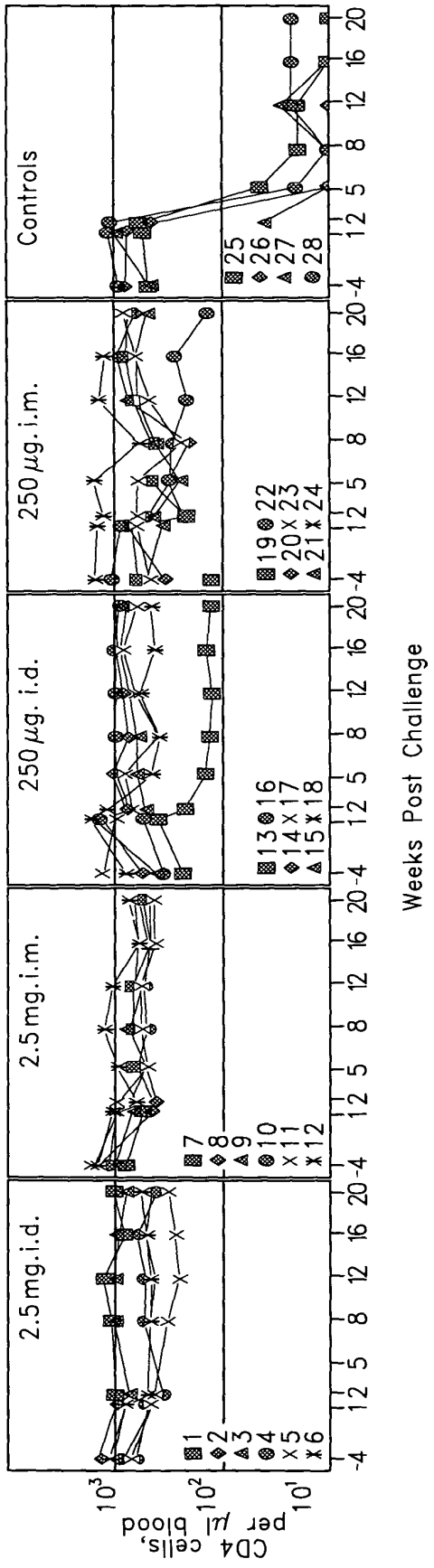
Controls
250 μg. i.m.
250 μg. i.d.
2.5 mg. i.m.
2.5 mg. i.d.
25 26 27 28
19 22 20 23 21 24
13 16 14 17 15 18
7 8 9 10 11 12
1 2 3 4 5 6
-4 12 5 8 12 16 20 -4 12 5 8 12 16 20
Weeks Post Challenge
CD4 cells, per μl blood
10^3
10^2
10^1

FIG. 8E

12/63

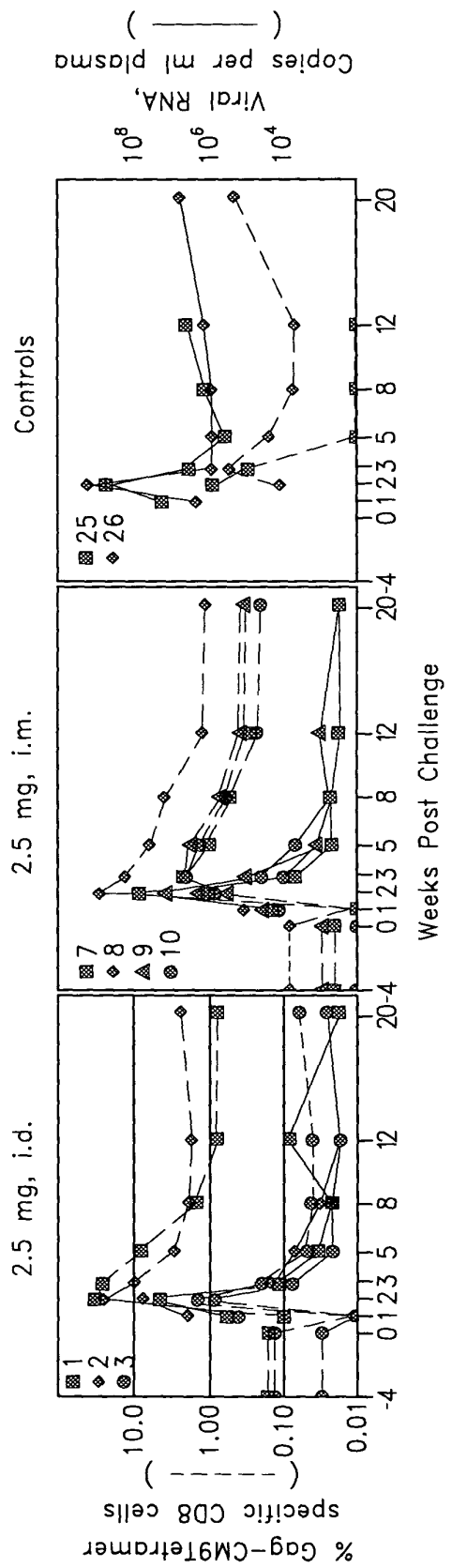
% Gag-CM9tetramer specific CD8 cells
(------)
10.0
1.00
0.10
0.01
2.5 mg, i.d.
2.5 mg, i.m.
Controls
1
2
3
7
8
9
10
25
26
-4
0
1
2
3
5
8
12
20
20-4
Weeks Post Challenge
Viral RNA, Copies per ml plasma
(———)
10^8
10^6
10^4

FIG. 9A

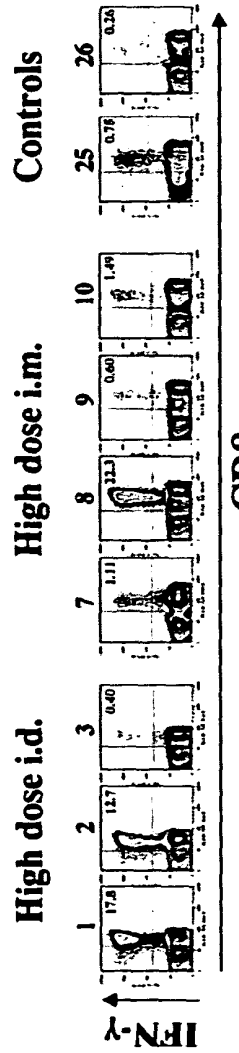
High dose i.d.
High dose i.m.
Controls
1
2
3
7
8
9
10
25
26
17.8
12.7
0.40
1.11
32.3
0.60
1.49
0.78
0.26
IFN-γ
CD8

FIG. 9B

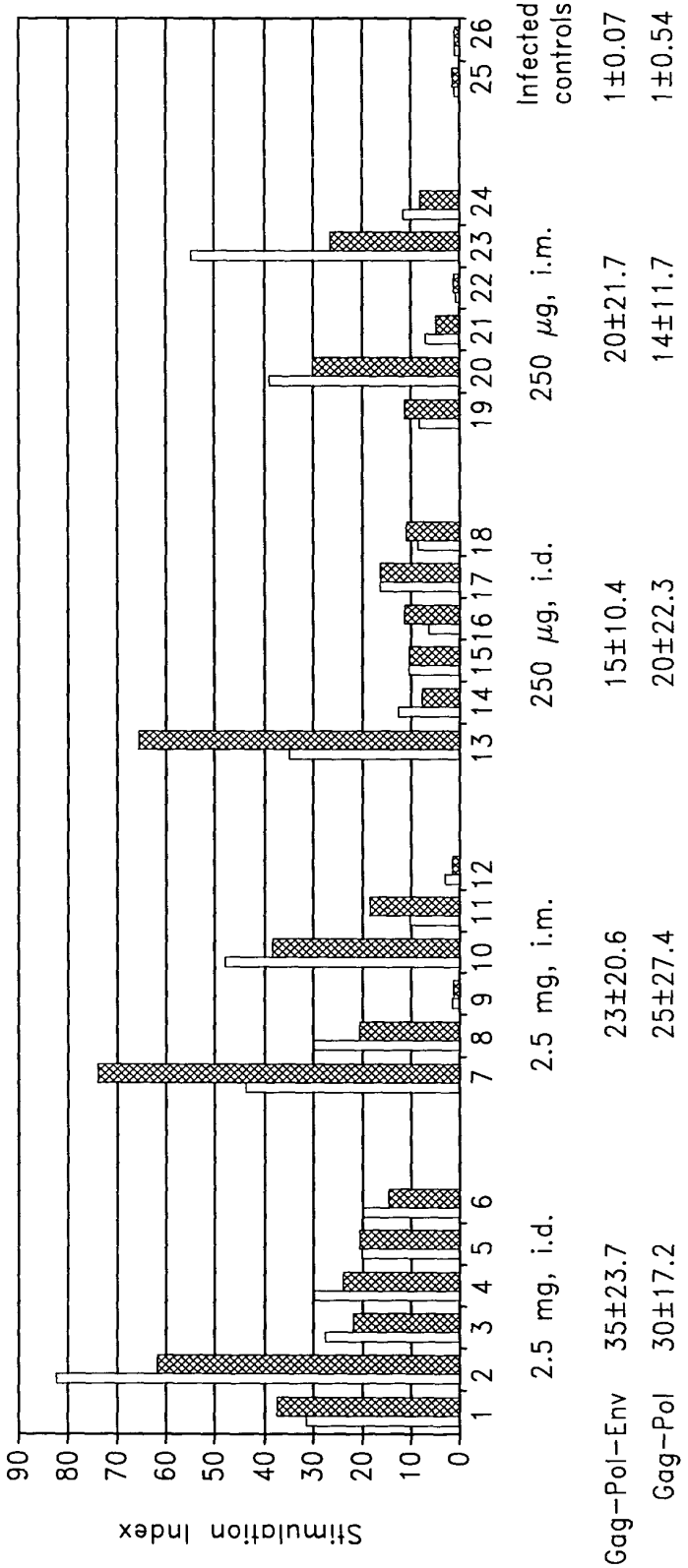
Stimulation Index
0
10
20
30
40
50
60
70
80
90
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
2.5 mg, i.d.
2.5 mg, i.m.
250 μg, i.d.
250 μg, i.m.
Infected controls
Gag-Pol-Env 35±23.7 23±20.6 15±10.4 20±21.7 1±0.07
Gag-Pol 30±17.2 25±27.4 20±22.3 14±11.7 1±0.54

FIG. 9C

FIG. 10C

FIG. 10B

FIG. 10A

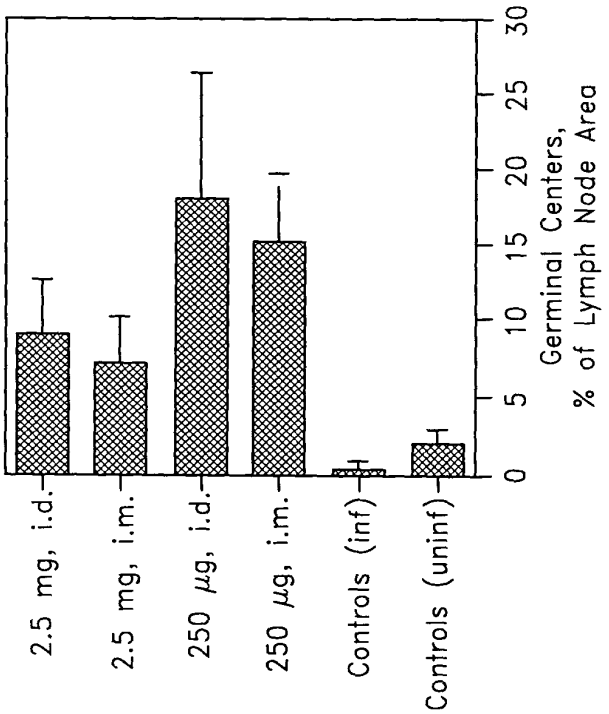
0
5
10
15
20
25
30
Germinal Centers,
% of Lymph Node Area
2.5 mg, i.d.
2.5 mg, i.m.
250 μg, i.d.
250 μg, i.m.
Controls (inf)
Controls (uninf)

FIG. 10D

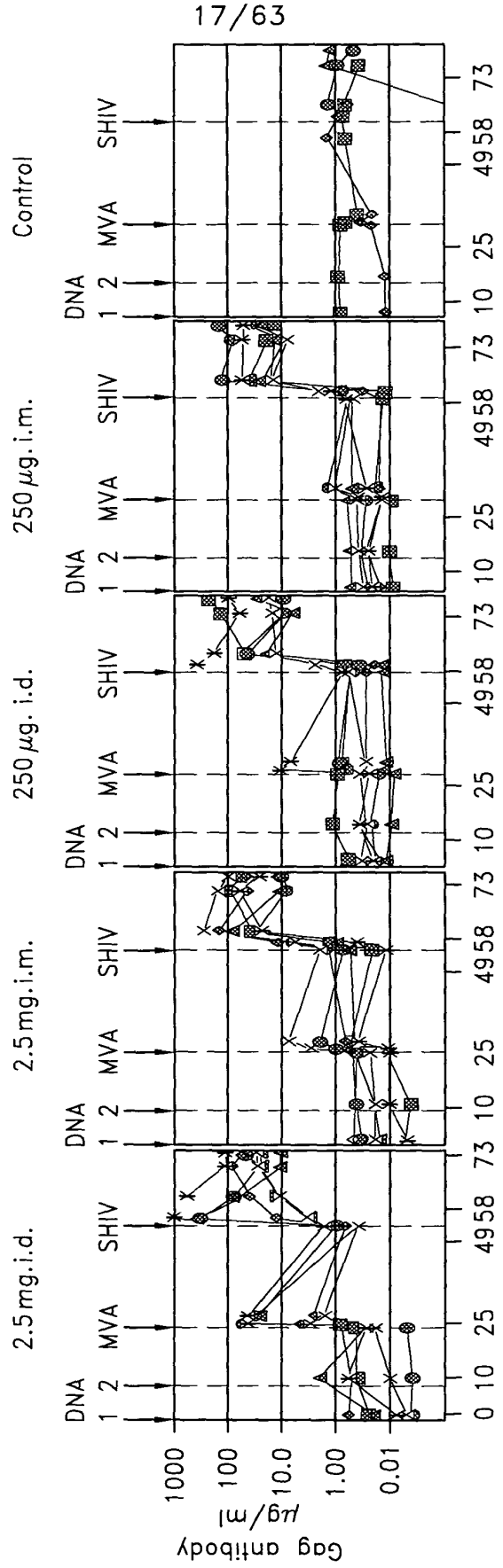
Gag antibody
μg/ml
1000
100
10.0
1.00
0.01
Control
250 μg. i.m.
250 μg. i.d.
2.5 mg. i.m.
2.5 mg. i.d.
DNA
MVA
SHIV
1 2
0 10 25
49 58 73

FIG. 11A

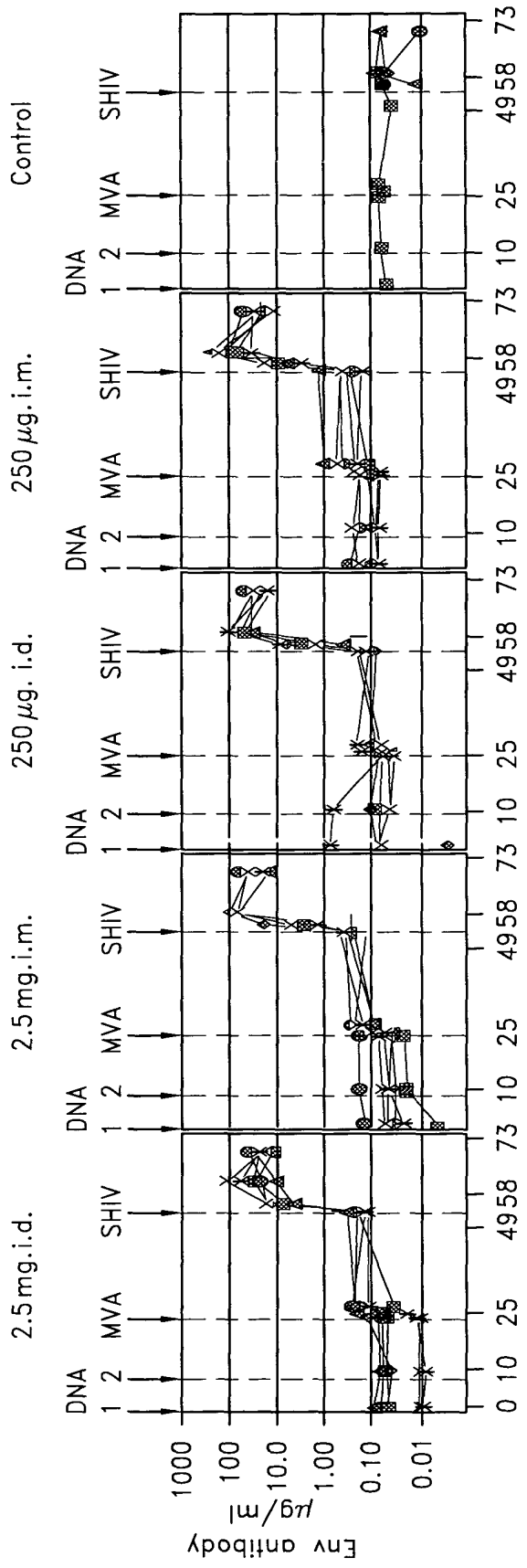
Env antibody
μg/ml
1000
100
10.0
1.00
0.10
0.01
2.5mg.i.d.
2.5mg.i.m.
250μg. i.d.
250μg. i.m.
Control
DNA
MVA
SHIV
1 2
0 10 25 49 58 73

FIG. 11B

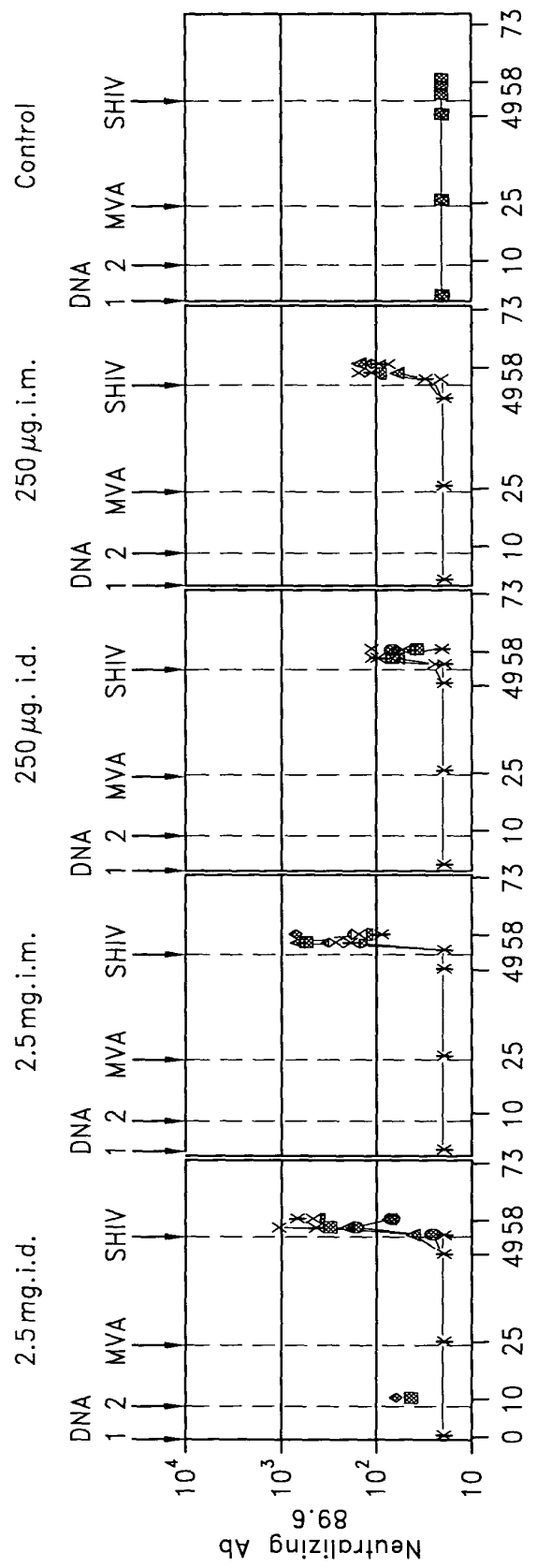
Neutralizing Ab
89.6
10^4
10^3
10^2
10
2.5mg.i.d.
2.5mg.i.m.
250 μg. i.d.
250 μg. i.m.
Control
DNA
MVA
SHIV
1 2
0 10 25 49 58 73

FIG. 11C

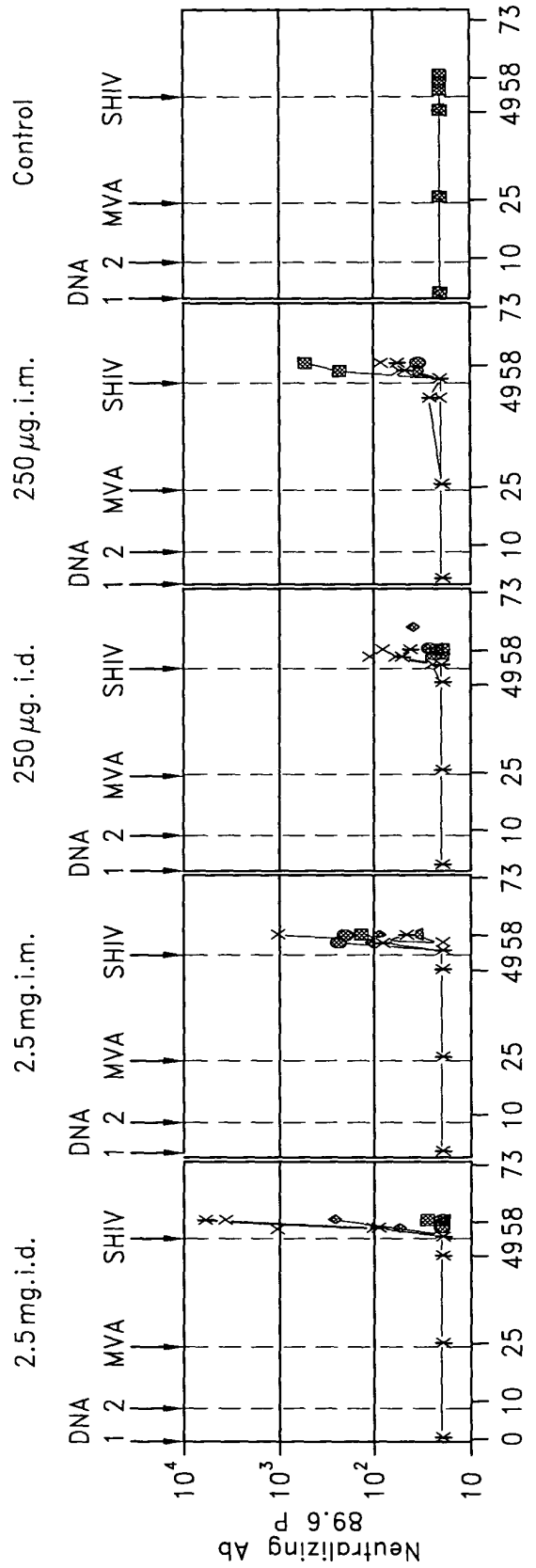
Neutralizing Ab
89.6 P
10^4
10^3
10^2
10
2.5mg.i.d.
2.5mg.i.m.
250 μg. i.d.
250 μg. i.m.
Control
DNA
MVA
SHIV
1 2
0 10 25
49 58 73

FIG. 11D

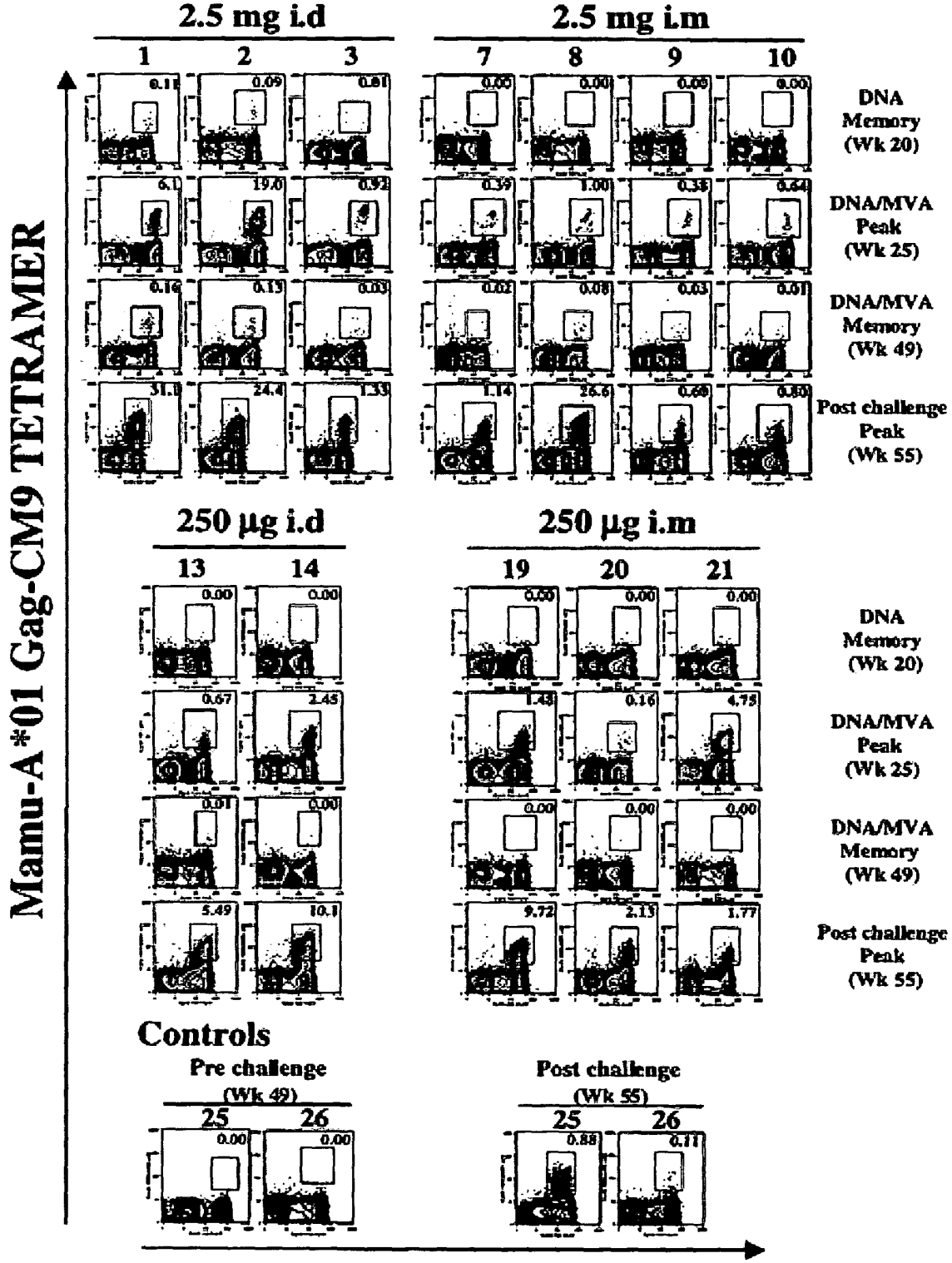
2.5 mg i.d
2.5 mg i.m
1
2
3
7
8
9
10
DNA Memory (Wk 20)
DNA/MVA Peak (Wk 25)
DNA/MVA Memory (Wk 49)
Post challenge Peak (Wk 55)
250 µg i.d
250 µg i.m
13
14
19
20
21
Mamu-A*01 Gag-CM9 TETRAMER
Controls
Pre challenge (Wk 49)
Post challenge (Wk 55)
25
26

FIG. 12

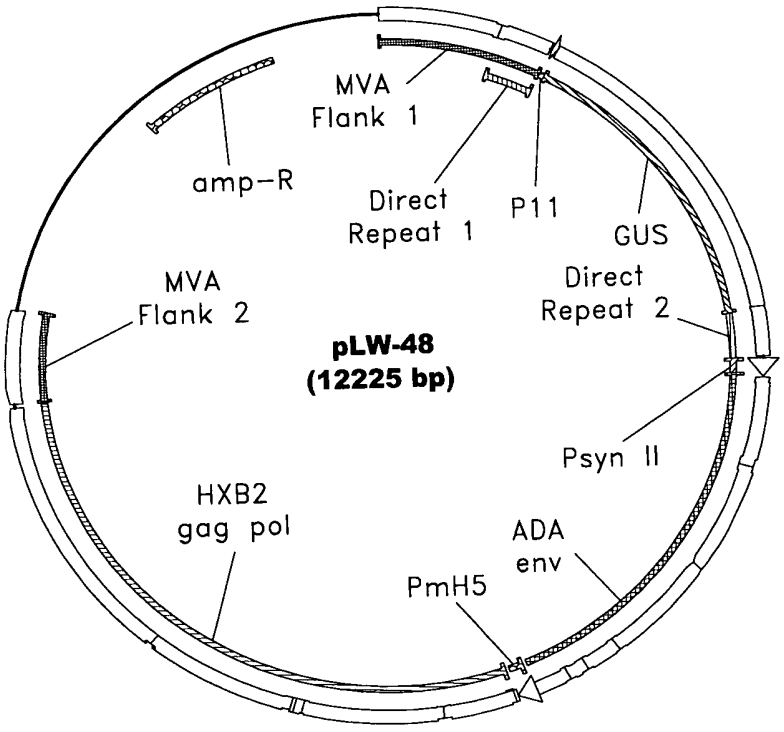
MVA
Flank 1
amp–R
Direct
Repeat 1
P11
GUS
MVA
Flank 2
Direct
Repeat 2
pLW-48
(12225 bp)
Psyn II
HXB2
gag pol
ADA
env
PmH5

FIG. 13

```
1   GAATTCGTTG GTGGTCGCCA TGGATGGTGT TATTGTATAC TGTCTAAACG CGTTAGTAAA ACATGGCGAG
    CTTAAGCAAC CACCAGCGGT ACCTACCACA ATAACATATG ACAGATTTGC GCAATCATTT TGTACCGCTC

71  GAAATAAATC ATATAAAAAA TGATTTCATG ATTAAACCAT GTTGTGAAAA AGTCAAGAAC GTTCACATTG
    CTTTATTTAG TATATTTTTT ACTAAAGTAC TAATTTGGTA CAACACTTTT TCAGTTCTTG CAAGTGTAAC

141 GCGGACAATC TAAAAACAAT ACAGTGATTG CAGATTTGCC ATATATGGAT AATGCGGTAT CCGATGTATG
    CGCCTGTTAG ATTTTTGTTA TGTCACTAAC GTCTAAACGG TATATACCTA TTACGCCATA GGCTACATAC

211 CAATTCACTG TATAAAAAGA ATGTATCAAG AATATCCAGA TTTGCTAATT TGATAAAGAT AGATGACGAT
    GTTAAGTGAC ATATTTTTCT TACATAGTTC TTATAGGTCT AAACGATTAA ACTATTTCTA TCTACTGCTA

281 GACAAGACTC CTACTGGTGT ATATAATTAT TTTAAACCTA AAGATGCCAT TCCTGTTATT ATATCCATAG
    CTGTTCTGAG GATGACCACA TATATTAATA AAATTTGGAT TTCTACGGTA AGGACAATAA TATAGGTATC

351 GAAAGGATAG AGATGTTTGT GAACTATTAA TCTCATCTGA TAAAGCGTGT GCGTGTATAG AGTTAAATTC
    CTTTCCTATC TCTACAAACA CTTGATAATT AGAGTAGACT ATTTCGCACA CGCACATATC TCAATTTAAG
```

FIG. 14A

```
421 ATATAAAGTA GCCATTCTTC CCATGGATGT TTCCTTTTTT ACCAAAGGAA ATGCATCATT GATTATTCTC
    TATATTTCAT CGGTAAGAAG GGTACCTACA AAGGAAAAAA TGGTTTCCTT TACGTAGTAA CTAATAAGAG

491 CTGTTTGATT TCTCTATCGA TGCGGCACCT CTCTTAAGAA GTGTAACCGA TAATAATGTT ATTATATCTA
    GACAAACTAA AGAGATAGCT ACGCCGTGGA GAGAATTCTT CACATTGGCT ATTATTACAA TAATATAGAT

561 GACACCAGCG TCTACATGAC GAGCTTCCGA GTTCCAATTG GTTCAAGTTT TACATAAGTA TAAAGTCCGA
    CTGTGGTCGC AGATGTACTG CTCGAAGGCT CAAGGTTAAC CAAGTTCAAA ATGTATTCAT ATTTCAGGCT

631 CTATTGTTCT ATATTATATA TGGTTGTTGA TGGATCTGTG ATGCATGCAA TAGCTGATAA TAGAACTTAC
    GATAACAAGA TATAATATAT ACCAACAACT ACCTAGACAC TACGTACGTT ATCGACTATT ATCTTGAATG

701 GCAAATATTA GCAAAAATAT ATTAGACAAT ACTACAATTA ACGATGAGTG TAGATGCTGT TATTTTGAAC
    CGTTTATAAT CGTTTTTATA TAATCTGTTA TGATGTTAAT TGCTACTCAC ATCTACGACA ATAAAACTTG
```

FIG. 14B

771 CACAGATTAG GATTCTTGAT AGAGATGAGA TGCTCAATGG ATCATCGTGT GATATGAACA GACATTGTAT
GTGTCTAATC CTAAGAACTA TCTCTACTCT ACGAGTTACC TAGTAGCACA CTATACTTGT CTGTAACATA

841 TATGATGAAT TTACCTGATG TAGGCGAATT TGGATCTAGT ATGTTGGGGA AATATGAACC TGACATGATT
ATACTACTTA AATGGACTAC ATCCGCTTAA ACCTAGATCA TACAACCCCT TTATACTTGG ACTGTACTAA

911 AAGATTGCTC TTTCGGTGGC TGGGTACCAG GCGCGCCTTT CATTTTGTTT TTTTCTATGC TATAAATGGT
TTCTAACGAG AAAGCCACCG ACCCATGGTC CGCGCGGAAA GTAAAACAAA AAAAGATACG ATATTTACCA

981 ACGTCCTGTA GAAACCCCAA CCCGTGAAAT CAAAAAACTC GACGGCCTGT GGGCATTCAG TCTGGATCGC
TGCAGGACAT CTTTGGGGTT GGGCACTTTA GTTTTTTGAG CTGCCGGACA CCCGTAAGTC AGACCTAGCG

1051 GAAAACTGTG GAATTGATCA GCGTTGGTGG GAAAGCGCGT TACAAGAAAG CCGGGCAATT GCTGTGCCAG
CTTTTGACAC CTTAACTAGT CGCAACCACC CTTTCGCGCA ATGTTCTTTC GGCCCGTTAA CGACACGGTC

FIG. 14C

```
1121  GCAGTTTTAA CGATCAGTTC GCCGATGCAG ATATTCGTAA TTATGCGGGC AACGTCTGGT ATCAGCGCGA
      CGTCAAAATT GCTAGTCAAG CGGCTACGTC TATAAGCATT AATACGCCCG TTGCAGACCA TAGTCGCGCT

1191  AGTCTTTATA CCGAAAGGTT GGGCAGGCCA GCGTATCGTG CTGCGTTTCG ATGCGGTCAC TCATTACGGC
      TCAGAAATAT GGCTTTCCAA CCCGTCCGGT CGCATAGCAC GACGCAAAGC TACGCCAGTG AGTAATGCCG

1261  AAAGTGTGGG TCAATAATCA GGAAGTGATG GAGCATCAGG GCGGCTATAC GCCATTTGAA GCCGATGTCA
      TTTCACACCC AGTTATTAGT CCTTCACTAC CTCGTAGTCC CGCCGATATG CGGTAAACTT CGGCTACAGT

1331  CGCCGTATGT TATTGCCGGG AAAAGTGTAC GTATCACCGT TTGTGTGAAC AACGAACTGA ACTGGCAGAC
      GCGGCATACA ATAACGGCCC TTTTCACATG CATAGTGGCA AACACACTTG TTGCTTGACT TGACCGTCTG

1401  TATCCCGCCG GGAATGGTGA TTACCGACGA AAACGGCAAG AAAAAGCAGT CTTACTTCCA TGATTTCTTT
      ATAGGGCGGC CCTTACCACT AATGGCTGCT TTTGCCGTTC TTTTTCGTCA GAATGAAGGT ACTAAAGAAA

1471  AACTATGCCG GAATCCATCG CAGCGTAATG CTCTACACCA CGCCGAACAC CTGGGTGGAC GATATCACCG
      TTGATACGGC CTTAGGTAGC GTCGCATTAC GAGATGTGGT GCGGCTTGTG GACCCACCTG CTATAGTGGC
```

FIG. 14D

```
1541  TGGTGACGCA TGTCGCGCAA GACTGTAACC ACGCGTCTGT TGACTGGCAG GTGGTGGCCA ATGGTGATGT
      ACCACTGCGT ACAGCGCGTT CTGACATTGG TGCGCAGACA ACTGACCGTC CACCACCGGT TACCACTACA

1611  CAGCGTTGAA CTGCGTGATG CGGATCAACA GGTGGTTGCA ACTGGACAAG GCACTAGCGG GACTTTGCAA
      GTCGCAACTT GACGCACTAC GCCTAGTTGT CCACCAACGT TGACCTGTTC CGTGATCGCC CTGAAACGTT

1681  GTGGTGAATC CGCACCTCTG GCAACCGGGT GAAGGTTATC TCTATGAACT GTGCGTCACA GCCAAAAGCC
      CACCACTTAG GCGTGGAGAC CGTTGGCCCA CTTCCAATAG AGATACTTGA CACGCAGTGT CGGTTTTCGG

1751  AGACAGAGTG TGATATCTAC CCGCTTCGCG TCGGCATCCG GTCAGTGGCA GTGAAGGGCG AACAGTTCCT
      TCTGTCTCAC ACTATAGATG GGCGAAGCGC AGCCGTAGGC CAGTCACCGT CACTTCCCGC TTGTCAAGGA

1821  GATTAACCAC AAACCGTTCT ACTTTACTGG CTTTGGTCGT CATGAAGATG CGGACTTGCG TGGCAAAGGA
      CTAATTGGTG TTTGGCAAGA TGAAATGACC GAAACCAGCA GTACTTCTAC GCCTGAACGC ACCGTTTCCT

1891  TTCGATAACG TGCTGATGGT GCACGACCAC GCATTAATGG ACTGGATTGG GGCCAACTCC TACCGTACCT
      AAGCTATTGC ACGACTACCA CGTGCTGGTG CGTAATTACC TGACCTAACC CCGGTTGAGG ATGGCATGGA
```

FIG. 14E

```
1961  CGCATTACCC TTACGCTGAA GAGATGCTCG ACTGGGCAGA TGAACATGGC ATCGTGGTGA TTGATGAAAC
      GCGTAATGGG AATGCGACTT CTCTACGAGC TGACCCGTCT ACTTGTACCG TAGCACCACT AACTACTTTG

2031  TGCTGCTGTC GGCTTTAACC TCTCTTTAGG CATTGGTTTC GAAGCGGGCA ACAAGCCGAA AGAACTGTAC
      ACGACGACAG CCGAAATTGG AGAGAAATCC GTAACCAAAG CTTCGCCCGT TGTTCGGCTT TCTTGACATG

2101  AGCGAAGAGG CAGTCAACGG GGAAACTCAG CAAGCGCACT TACAGGCGAT TAAAGAGCTG ATAGCGCGTG
      TCGCTTCTCC GTCAGTTGCC CCTTTGAGTC GTTCGCGTGA ATGTCCGCTA ATTTCTCGAC TATCGCGCAC

2171  ACAAAAACCA CCCAAGCGTG GTGATGTGGA GTATTGCCAA CGAACCGGAT ACCCGTCCGC AAGGTGCACG
      TGTTTTTGGT GGGTTCGCAC CACTACACCT CATAACGGTT GCTTGGCCTA TGGGCAGGCG TTCCACGTGC

2241  GGAATATTTC GCGCCACTGG CGGAAGCAAC GCGTAAACTC GACCCGACGC GTCCGATCAC CTGCGTCAAT
      CCTTATAAAG CGCGGTGACC GCCTTCGTTG CGCATTTGAG CTGGGCTGCG CAGGCTAGTG GACGCAGTTA

2311  GTAATGTTCT GCGACGCTCA CACCGATACC ATCAGCGATC TCTTTGATGT GCTGTGCCTG AACCGTTATT
      CATTACAAGA CGCTGCGAGT GTGGCTATGG TAGTCGCTAG AGAAACTACA CGACACGGAC TTGGCAATAA
```

FIG. 14F

```
2381  ACGGATGGTA TGTCCAAAGC GGCGATTTGG AAACGGCAGA GAAGGTACTG GAAAAAGAAC TTCTGGCCTG
      TGCCTACCAT ACAGGTTTCG CCGCTAAACC TTTGCCGTCT CTTCCATGAC CTTTTTCTTG AAGACCGGAC

2451  GCAGGAGAAA CTGCATCAGC CGATTATCAT CACCGAATAC GGCGTGGATA CGTTAGCCGG GCTGCACTCA
      CGTCCTCTTT GACGTAGTCG GCTAATAGTA GTGGCTTATG CCGCACCTAT GCAATCGGCC CGACGTGAGT

2521  ATGTACACCG ACATGTGGAG TGAAGAGTAT CAGTGTGCAT GGCTGGATAT GTATCACCGC GTCTTTGATC
      TACATGTGGC TGTACACCTC ACTTCTCATA GTCACACGTA CCGACCTATA CATAGTGGCG CAGAAACTAG

2591  GCGTCAGCGC CGTCGTCGGT GAACAGGTAT GGAATTTCGC CGATTTTGCG ACCTCGCAAG GCATATTGCG
      CGCAGTCGCG GCAGCAGCCA CTTGTCCATA CCTTAAAGCG GCTAAAACGC TGGAGCGTTC CGTATAACGC

2661  CGTTGGCGGT AACAAGAAAG GGATCTTCAC TCGCGACCGC AAACCGAAGT CGGCGGCTTT TCTGCTGCAA
      GCAACCGCCA TTGTTCTTTC CCTAGAAGTG AGCGCTGGCG TTTGGCTTCA GCCGCCGAAA AGACGACGTT

2731  AAACGCTGGA CTGGCATGAA CTTCGGTGAA AAACCGCAGC AGGGAGGCAA ACAATGAGAG CTCGGTTGTT
      TTTGCGACCT GACCGTACTT GAAGCCACTT TTTGGCGTCG TCCCTCCGTT TGTTACTCTC GAGCCAACAA
```

FIG. 14G

2801 GATGGATCTG TGATGCATGC AATAGCTGAT AATAGAACTT ACGCAAATAT TAGCAAAAAT ATATTAGACA
CTACCTAGAC ACTACGTACG TTATCGACTA TTATCTTGAA TGCGTTTATA ATCGTTTTTA TATAATCTGT

2871 ATACTACAAT TAACGATGAG TGTAGATGCT GTTATTTTGA ACCACAGATT AGGATTCTTG ATAGAGATGA
TATGATGTTA ATTGCTACTC ACATCTACGA CAATAAAACT TGGTGTCTAA TCCTAAGAAC TATCTCTACT

2941 GATGCTCAAT GGATCATCGT GTGATATGAA CAGACATTGT ATTATGATGA ATTTACCTGA TGTAGGCGAA
CTACGAGTTA CCTAGTAGCA CACTATACTT GTCTGTAACA TAATACTACT TAAATGGACT ACATCCGCTT

3011 TTTGGATCTA GTATGTTGGG GAAATATGAA CCTGACATGA TTAAGATTGC TCTTTCGGTG GCTGGCGGCC
AAACCTAGAT CATACAACCC CTTTATACTT GGACTGTACT AATTCTAACG AGAAAGCCAC CGACCGCCGG

3081 CGCTCGAGTA AAAAATGAAA AAATATTCTA ATTTATAGGA CGGTTTTGAT TTTCTTTTTT TCTATGCTAT
GCGAGCTCAT TTTTTACTTT TTTATAAGAT TAAATATCCT GCCAAAAACTA AAAGAAAAAA AGATACGATA

3151 AAATAATAAA TAGCGGCCGC ACCATGAAAG TGAAGGGGAT CAGGAAGAAT TATCAGCACT TGTGGAAATG
TTTATTATTT ATCGCCGGCG TGGTACTTTC ACTTCCCCTA GTCCTTCTTA ATAGTCGTGA ACACCTTTAC

FIG. 14H

```
3221  GGGCATCATG CTCCTTGGGA TGTTGATGAT CTGTAGTGCT GTAGAAAATT TGTGGGTCAC AGTTTATTAT
      CCCGTAGTAC GAGGAACCCT ACAACTACTA GACATCACGA CATCTTTTAA ACACCCAGTG TCAAATAATA

3291  GGGGTACCTG TGTGGAAAGA AGCAACCACC ACTCTATTTT GTGCATCAGA TGCTAAAGCA TATGATACAG
      CCCCATGGAC ACACCTTTCT TCGTTGGTGG TGAGATAAAA CACGTAGTCT ACGATTTCGT ATACTATGTC

3361  AGGTACATAA TGTTTGGGCC ACACATGCCT GTGTACCCAC AGACCCCAAC CCACAAGAAG TAGTATTGGA
      TCCATGTATT ACAAACCCGG TGTGTACGGA CACATGGGTG TCTGGGGTTG GGTGTTCTTC ATCATAACCT

3431  AAATGTGACA GAAAATTTTA ACATGTGGAA AAATAACATG GTAGAACAGA TGCATGAGGA TATAATCAGT
      TTTACACTGT CTTTTAAAAT TGTACACCTT TTTATTGTAC CATCTTGTCT ACGTACTCCT ATATTAGTCA

3501  TTATGGGATC AAAGCCTAAA GCCATGTGTA AAATTAACCC CACTCTGTGT TACTTTAAAT TGCACTGATT
      AATACCCTAG TTTCGGATTT CGGTACACAT TTTAATTGGG GTGAGACACA ATGAAATTTA ACGTGACTAA

3571  TGAGGAATGT TACTAATATC AATAATAGTA GTGAGGGAAT GAGAGGAGAA ATAAAAAACT GCTCTTTCAA
      ACTCCTTACA ATGATTATAG TTATTATCAT CACTCCCTTA CTCTCCTCTT TATTTTTTGA CGAGAAAGTT
```

FIG. 14I

```
3641  TATCACCACA AGCATAAGAG ATAAGGTGAA GAAAGACTAT GCACTTTTCT ATAGACTTGA TGTAGTACCA
      ATAGTGGTGT TCGTATTCTC TATTCCACTT CTTTCTGATA CGTGAAAAGA TATCTGAACT ACATCATGGT

3711  ATAGATAATG ATAATACTAG CTATAGGTTG ATAAATTGTA ATACCTCAAC CATTACACAG GCCTGTCCAA
      TATCTATTAC TATTATGATC GATATCCAAC TATTTAACAT TATGGAGTTG GTAATGTGTC CGGACAGGTT

3781  AGGTATCCTT TGAGCCAATT CCCATACATT ATTGTACCCC GGCTGGTTTT GCGATTCTAA AGTGTAAAGA
      TCCATAGGAA ACTCGGTTAA GGGTATGTAA TAACATGGGG CCGACCAAAA CGCTAAGATT TCACATTTCT

3851  CAAGAAGTTC AATGGAACAG GGCCATGTAA AAATGTCAGC ACAGTACAAT GTACACATGG AATTAGGCCA
      GTTCTTCAAG TTACCTTGTC CCGGTACATT TTTACAGTCG TGTCATGTTA CATGTGTACC TTAATCCGGT

3921  GTAGTGTCAA CTCAACTGCT GTTAAATGGC AGTCTAGCAG AAGAAGAGGT AGTAATTAGA TCTAGTAATT
      CATCACAGTT GAGTTGACGA CAATTTACCG TCAGATCGTC TTCTTCTCCA TCATTAATCT AGATCATTAA

3991  TCACAGACAA TGCAAAAAAC ATAATAGTAC AGTTGAAAGA ATCTGTAGAA ATTAATTGTA CAAGACCCAA
      AGTGTCTGTT ACGTTTTTTG TATTATCATG TCAACTTTCT TAGACATCTT TAATTAACAT GTTCTGGGTT
```

FIG. 14J

```
4061  CAACAATACA AGGAAAAGTA TACATATAGG ACCAGGAAGA GCATTTTATA CAACAGGAGA AATAATAGGA
      GTTGTTATGT TCCTTTTCAT ATGTATATCC TGGTCCTTCT CGTAAAATAT GTTGTCCTCT TTATTATCCT

4131  GATATAAGAC AAGCACATTG CAACATTAGT AGAACAAAAT GGAATAACAC TTTAAATCAA ATAGCTACAA
      CTATATTCTG TTCGTGTAAC GTTGTAATCA TCTTGTTTTA CCTTATTGTG AAATTTAGTT TATCGATGTT

4201  AATTAAAAGA ACAATTTGGG AATAATAAAA CAATAGTCTT TAATCAATCC TCAGGAGGGG ACCCAGAAAT
      TTAATTTTCT TGTTAAACCC TTATTATTTT GTTATCAGAA ATTAGTTAGG AGTCCTCCCC TGGGTCTTTA

4271  TGTAATGCAC AGTTTTAATT GTGGAGGGGA ATTCTTCTAC TGTAATTCAA CACAACTGTT TAATAGTACT
      ACATTACGTG TCAAAATTAA CACCTCCCCT TAAGAAGATG ACATTAAGTT GTGTTGACAA ATTATCATGA

4341  TGGAATTTTA ATGGTACTTG GAATTTAACA CAATCGAATG GTACTGAAGG AAATGACACT ATCACACTCC
      ACCTTAAAAT TACCATGAAC CTTAAATTGT GTTAGCTTAC CATGACTTCC TTTACTGTGA TAGTGTGAGG

4411  CATGTAGAAT AAAACAAATT ATAAATATGT GGCAGGAAGT AGGAAAAGCA ATGTATGCCC CTCCCATCAG
      GTACATCTTA TTTTGTTTAA TATTTATACA CCGTCCTTCA TCCTTTTCGT TACATACGGG GAGGGTAGTC
```

FIG. 14K

```
4481  AGGACAAATT AGATGCTCAT CAAATATTAC AGGGCTAATA TTAACAAGAG ATGGTGGAAC TAACAGTAGT
      TCCTGTTTAA TCTACGAGTA GTTTATAATG TCCCGATTAT AATTGTTCTC TACCACCTTG ATTGTCATCA

4551  GGGTCCGAGA TCTTCAGACC TGGGGGAGGA GATATGAGGG ACAATTGGAG AAGTGAATTA TATAAATATA
      CCCAGGCTCT AGAAGTCTGG ACCCCCTCCT CTATACTCCC TGTTAACCTC TTCACTTAAT ATATTTATAT

4621  AAGTAGTAAA AATTGAACCA TTAGGAGTAG CACCCACCAA GGCAAAAAGA AGAGTGGTGC AGAGAGAAAA
      TTCATCATTT TTAACTTGGT AATCCTCATC GTGGGTGGTT CCGTTTTTCT TCTCACCACG TCTCTCTTTT

4691  AAGAGCAGTG GGAACGATAG GAGCTATGTT CCTTGGGTTC TTGGGAGCAG CAGGAAGCAC TATGGGCGCA
      TTCTCGTCAC CCTTGCTATC CTCGATACAA GGAACCCAAG AACCCTCGTC GTCCTTCGTG ATACCCGCGT

4761  GCGTCAATAA CGCTGACGGT ACAGGCCAGA CTATTATTGT CTGGTATAGT GCAACAGCAG AACAATTTGC
      CGCAGTTATT GCGACTGCCA TGTCCGGTCT GATAATAACA GACCATATCA CGTTGTCGTC TTGTTAAACG

4831  TGAGGCTAT TGAGGCGCAA CAGCATCTGT TGCAACTCAC AGTCTGGGGC ATCAAGCAGC TCCAGGCAAG
      ACTCCCGATA ACTCCGCGTT GTCGTAGACA ACGTTGAGTG TCAGACCCCG TAGTTCGTCG AGGTCCGTTC
```

FIG. 14L

```
4901  AGTCCTGGCT GTGGAAAGAT ACCTAAGGGA TCAACAGCTC CTAGGGATTT GGGGTTGCTC TGGAAAACTC
      TCAGGACCGA CACCTTTCTA TGGATTCCCT AGTTGTCGAG GATCCCTAAA CCCCAACGAG ACCTTTTGAG

4971  ATCTGCACCA CTGCTGTGCC TTGGAATGCT AGTTGGAGTA ATAAAACTCT GGATATGATT TGGGATAACA
      TAGACGTGGT GACGACACGG AACCTTACGA TCAACCTCAT TATTTTGAGA CCTATACTAA ACCCTATTGT

5041  TGACCTGGAT GGAGTGGGAA AGAGAAATCG AAAATTACAC AGGCTTAATA TACACCTTAA TTGAGGAATC
      ACTGGACCTA CCTCACCCTT TCTCTTTAGC TTTTAATGTG TCCGAATTAT ATGTGGAATT AACTCCTTAG

5111  GCAGAACCAA CAAGAAAAGA ATGAACAAGA CTTATTAGCA TTAGATAAGT GGGCAAGTTT GTGGAATTGG
      CGTCTTGGTT GTTCTTTTCT TACTTGTTCT GAATAATCGT AATCTATTCA CCCGTTCAAA CACCTTAACC

5181  TTTGACATAT CAAATTGGCT GTGGTATGTA AAAATCTTCA TAATGATAGT AGGAGGCTTG ATAGGTTTAA
      AAACTGTATA GTTTAACCGA CACCATACAT TTTTAGAAGT ATTACTATCA TCCTCCGAAC TATCCAAATT

5251  GAATAGTTTT TACTGTACTT TCTATAGTAA ATAGAGTTAG GCAGGGATAC TCACCATTGT CATTTCAGAC
      CTTATCAAAA ATGACATGAA AGATATCATT TATCTCAATC CGTCCCTATG AGTGGTAACA GTAAAGTCTG
```

FIG. 14M

```
5321  CCACCTCCCA GCCCCGAGGG GACCCGACAG GCCCGAAGGA ATCGAAGAAG AAGGTGGAGA CAGAGACTAA
      GGTGGAGGGT CGGGGCTCCC CTGGGCTGTC CGGGCTTCCT TAGCTTCTTC TTCCACCTCT GTCTCTGATT

5391  TTTTTATGCG GCCGCTGGTA CCCAACCTAA AAATTGAAAA TAAATACAAA GGTTCTTGAG GGTTGTGTTA
      AAAAATACGC CGGCGACCAT GGGTTGGATT TTTAACTTTT ATTTATGTTT CCAAGAACTC CCAACACAAT

5461  AATTGAAAGC GAGAAATAAT CATAAATAAG CCCGGGGATC CTCTAGAGTC GACACCATGG GTGCGAGAGC
      TTAACTTTCG CTCTTTATTA GTATTTATTC GGGCCCCTAG GAGATCTCAG CTGTGGTACC CACGCTCTCG

5531  GTCAGTATTA AGCGGGGGAG AATTAGATCG ATGGGAAAAA ATTCGGTTAA GGCCAGGGGG AAAGAAAAAA
      CAGTCATAAT TCGCCCCCTC TTAATCTAGC TACCCTTTTT TAAGCCAATT CCGGTCCCCC TTTCTTTTTT

5601  TATAAATTAA AACATATAGT ATGGGCAAGC AGGGAGCTAG AACGATTCGC AGTTAATCCT GGCCTGTTAG
      ATATTTAATT TTGTATATCA TACCCGTTCG TCCCTCGATC TTGCTAAGCG TCAATTAGGA CCGGACAATC

5671  AAACATCAGA AGGCTGTAGA CAAATACTGG GACAGCTACA ACCATCCCTT CAGACAGGAT CAGAAGAACT
      TTTGTAGTCT TCCGACATCT GTTTATGACC CTGTCGATGT TGGTAGGGAA GTCTGTCCTA GTCTTCTTGA
```

FIG. 14N

```
5741  TAGATCATTA TATAATACAG TAGCAACCCT CTATTGTGTG CATCAAAGGA TAGAGATAAA AGACACCAAG
      ATCTAGTAAT ATATTATGTC ATCGTTGGGA GATAACACAC GTAGTTTCCT ATCTCTATTT TCTGTGGTTC

5811  GAAGCTTTAG ACAAGATAGA GGAAGAGCAA AACAAAAGTA AGAAAAAAGC ACAGCAAGCA GCAGCTGACA
      CTTCGAAATC TGTTCTATCT CCTTCTCGTT TTGTTTTCAT TCTTTTTTCG TGTCGTTCGT CGTCGACTGT

5881  CAGGACACAG CAATCAGGTC AGCCAAAATT ACCCTATAGT GCAGAACATC CAGGGGCAAA TGGTACATCA
      GTCCTGTGTC GTTAGTCCAG TCGGTTTTAA TGGGATATCA CGTCTTGTAG GTCCCCGTTT ACCATGTAGT

5951  GGCCATATCA CCTAGAACTT TAAATGCATG GGTAAAAGTA GTAGAAGAGA AGGCTTTCAG CCCAGAAGTG
      CCGGTATAGT GGATCTTGAA ATTTACGTAC CCATTTTCAT CATCTTCTCT TCCGAAAGTC GGGTCTTCAC

6021  ATACCCATGT TTTCAGCATT ATCAGAAGGA GCCACCCCAC AAGATTTAAA CACCATGCTA AACACAGTGG
      TATGGGTACA AAAGTCGTAA TAGTCTTCCT CGGTGGGGTG TTCTAAATTT GTGGTACGAT TTGTGTCACC

6091  GGGGACATCA AGCAGCCATG CAAATGTTAA AAGAGACCAT CAATGAGGAA GCTGCAGAAT GGGATAGAGT
      CCCCTGTAGT TCGTCGGTAC GTTTACAATT TTCTCTGGTA GTTACTCCTT CGACGTCTTA CCCTATCTCA
```

FIG. 140

```
6161  GCATCCAGTG CATGCAGGGC CTATTGCACC AGGCCAGATG AGAGAACCAA GGGGAAGTGA CATAGCAGGA
      CGTAGGTCAC GTACGTCCCG GATAACGTGG TCCGGTCTAC TCTCTTGGTT CCCCTTCACT GTATCGTCCT

6231  ACTACTAGTA CCCTTCAGGA ACAAATAGGA TGGATGACAA ATAATCCACC TATCCCAGTA GGAGAAATTT
      TGATGATCAT GGGAAGTCCT TGTTTATCCT ACCTACTGTT TATTAGGTGG ATAGGGTCAT CCTCTTTAAA

6301  ATAAAAGATG GATAATCCTG GGATTAAATA AAATAGTAAG AATGTATAGC CCTACCAGCA TTCTGGACAT
      TATTTTCTAC CTATTAGGAC CCTAATTTAT TTTATCATTC TTACATATCG GGATGGTCGT AAGACCTGTA

6371  AAGACAAGGA CCAAAAGAAC CCTTTAGAGA CTATGTAGAC CGGTTCTATA AAACTCTAAG AGCCGAGCAA
      TTCTGTTCCT GGTTTTCTTG GGAAATCTCT GATACATCTG GCCAAGATAT TTTGAGATTC TCGGCTCGTT

6441  GCTTCACAGG AGGTAAAAAA TTGGATGACA GAAACCTTGT TGGTCCAAAA TGCGAACCCA GATTGTAAGA
      CGAAGTGTCC TCCATTTTTT AACCTACTGT CTTTGGAACA ACCAGGTTTT ACGCTTGGGT CTAACATTCT

6511  CTATTTTAAA AGCATTGGGA CCAGCGGCTA CACTAGAAGA AATGATGACA GCATGTCAGG GAGTAGGAGG
      GATAAAATTT TCGTAACCCT GGTCGCCGAT GTGATCTTCT TTACTACTGT CGTACAGTCC CTCATCCTCC
```

FIG. 14P

```
6581  ACCCGGCCAT AAGGCAAGAG TTTTGGCTGA AGCAATGAGC CAAGTAACAA ATTCAGCTAC CATAATGATG
      TGGGCCGGTA TTCCGTTCTC AAAACCGACT TCGTTACTCG GTTCATTGTT TAAGTCGATG GTATTACTAC

6651  CAGAGAGGCA ATTTTAGGAA CCAAAGAAAG ATTGTTAAGT GTTTCAATTG TGGCAAAGAA GGGCACACAG
      GTCTCTCCGT TAAAATCCTT GGTTTCTTTC TAACAATTCA CAAAGTTAAC ACCGTTTCTT CCCGTGTGTC

6721  CCAGAAATTG CAGGGCCCCT AGGAAAAAGG GCTGTTGGAA ATGTGGAAAG GAAGGACACC AAATGAAAGA
      GGTCTTTAAC GTCCCGGGGA TCCTTTTTCC CGACAACCTT TACACCTTTC CTTCCTGTGG TTTACTTTCT

6791  TTGTACTGAG AGACAGGCTA ATTTTTTAGG GAAGATCTGG CCTTCCTACA AGGGAAGGCC AGGGAATTTT
      AACATGACTC TCTGTCCGAT TAAAAAATCC CTTCTAGACC GGAAGGATGT TCCCTTCCGG TCCCTTAAAA

6861  CTTCAGAGCA GACCAGAGCC AACAGCCCCA CCAGAAGAGA GCTTCAGGTC TGGGGTAGAG ACAACAACTC
      GAAGTCTCGT CTGGTCTCGG TTGTCGGGGT GGTCTTCTCT CGAAGTCCAG ACCCCATCTC TGTTGTTGAG

6931  CCCCTCAGAA GCAGGAGCCG ATAGACAAGG AACTGTATCC TTTAACTTCC CTCAGATCAC TCTTTGGCAA
      GGGGAGTCTT CGTCCTCGGC TATCTGTTCC TTGACATAGG AAATTGAAGG GAGTCTAGTG AGAAACCGTT
```

FIG. 14Q

```
7001  CGACCCCTCG TCACAATAAA GATAGGGGGG CAACTAAAGG AAGCTCTATT AGATACAGGA GCAGATGATA
      GCTGGGGAGC AGTGTTATTT CTATCCCCCC GTTGATTTCC TTCGAGATAA TCTATGTCCT CGTCTACTAT

7071  CAGTATTAGA AGAAATGAGT TTGCCAGGAA GATGGAAACC AAAAATGATA GGGGGAATTG GAGGTTTTAT
      GTCATAATCT TCTTTACTCA AACGGTCCTT CTACCTTTGG TTTTTACTAT CCCCCTTAAC CTCCAAAATA

7141  CAAAGTAAGA CAGTATGATC AGATACTCAT AGAAATCTGT GGACATAAAG CTATAGGTAC AGTATTAGTA
      GTTTCATTCT GTCATACTAG TCTATGAGTA TCTTTAGACA CCTGTATTTC GATATCCATG TCATAATCAT

7211  GGACCTACAC CTGTCAACAT AATTGGAAGA AATCTGTTGA CTCAGATTGG TTGCACTTTA AATTTTCCCA
      CCTGGATGTG GACAGTTGTA TTAACCTTCT TTAGACAACT GAGTCTAACC AACGTGAAAT TTAAAAGGGT

7281  TTAGCCCTAT TGAGACTGTA CCAGTAAAAT TAAAGCCAGG AATGGATGGC CCAAAAGTTA AACAATGGCC
      AATCGGGATA ACTCTGACAT GGTCATTTTA ATTTCGGTCC TTACCTACCG GGTTTTCAAT TTGTTACCGG

7351  ATTGACAGAA GAAAAAATAA AAGCATTAGT AGAAATTTGT ACAGAAATGG AAAAGGAAGG GAAAATTTCA
      TAACTGTCTT CTTTTTTATT TTCGTAATCA TCTTTAAACA TGTCTTTACC TTTTCCTTCC CTTTTAAAGT
```

FIG. 14R

```
7421  AAAATTGGGC CTGAGAATCC ATACAATACT CCAGTATTTG CCATAAAGAA AAAAGACAGT ACTAAATGGA
      TTTTAACCCG GACTCTTAGG TATGTTATGA GGTCATAAAC GGTATTTCTT TTTTCTGTCA TGATTTACCT

7491  GGAAATTAGT AGATTTCAGA GAACTTAATA AGAGAACTCA AGACTTCTGG GAAGTTCAAT TAGGAATACC
      CCTTTAATCA TCTAAAGTCT CTTGAATTAT TCTCTTGAGT TCTGAAGACC CTTCAAGTTA ATCCTTATGG

7561  ACATCCCGCA GGGTTAAAAA AGAAAAAATC AGTAACAGTA CTGGATGTGG GTGATGCATA TTTTTCAGTT
      TGTAGGGCGT CCCAATTTTT TCTTTTTTAG TCATTGTCAT GACCTACACC CACTACGTAT AAAAAGTCAA

7631  CCCTTAGATG AAGACTTCAG GAAGTATACT GCATTTACCA TACCTAGTAT AAACAATGAG ACACCAGGGA
      GGGAATCTAC TTCTGAAGTC CTTCATATGA CGTAAATGGT ATGGATCATA TTTGTTACTC TGTGGTCCCT

7701  TTAGATATCA GTACAATGTG CTTCCACAGG GATGGAAAGG ATCACCAGCA ATATTCCAAA GTAGCATGAC
      AATCTATAGT CATGTTACAC GAAGGTGTCC CTACCTTTCC TAGTGGTCGT TATAAGGTTT CATCGTACTG

7771  AAAAATCTTA GAGCCTTTTA AAAAACAAAA TCCAGACATA GTTATCTATC AATACATGAA CGATTTGTAT
      TTTTTAGAAT CTCGGAAAAT TTTTTGTTTT AGGTCTGTAT CAATAGATAG TTATGTACTT GCTAAACATA
```

FIG. 14S

```
7841  GTAGGATCTG ACTTAGAAAT AGGGCAGCAT AGAACAAAAA TAGAGGAGCT GAGACAACAT CTGTTGAGGT
      CATCCTAGAC TGAATCTTTA TCCCGTCGTA TCTTGTTTTT ATCTCCTCGA CTCTGTTGTA GACAACTCCA

7911  GGGGACTTAC CACACCAGAC AAAAAACATC AGAAAGAACC TCCATTCCTT TGGATGGGTT ATGAACTCCA
      CCCCTGAATG GTGTGGTCTG TTTTTTGTAG TCTTTCTTGG AGGTAAGGAA ACCTACCCAA TACTTGAGGT

7981  TCCTGATAAA TGGACAGTAC AGCCTATAGT GCTGCCAGAA AAAGACAGCT GGACTGTCAA TGACATACAG
      AGGACTATTT ACCTGTCATG TCGGATATCA CGACGGTCTT TTTCTGTCGA CCTGACAGTT ACTGTATGTC

8051  AAGTTAGTGG GGAAATTGAA TACCGCAAGT CAGATTTACC CAGGGATTAA AGTAAGGCAA TTATGTAAAC
      TTCAATCACC CCTTTAACTT ATGGCGTTCA GTCTAAATGG GTCCCTAATT TCATTCCGTT AATACATTTG

8121  TCCTTAGAGG AACCAAAGCA CTAACAGAAG TAATACCACT AACAGAAGAA GCAGAGCTAG AACTGGCAGA
      AGGAATCTCC TTGGTTTCGT GATTGTCTTC ATTATGGTGA TTGTCTTCTT CGTCTCGATC TTGACCGTCT

8191  AAACAGAGAG ATTCTAAAAG AACCAGTACA TGGAGTGTAT TATGACCCAT CAAAAGACTT AATAGCAGAA
      TTTGTCTCTC TAAGATTTTC TTGGTCATGT ACCTCACATA ATACTGGGTA GTTTTCTGAA TTATCGTCTT
```

FIG. 14T

```
8261  ATACAGAAGC AGGGGCAAGG CCAATGGACA TATCAAATTT ATCAAGAGCC ATTTAAAAAT CTGAAAACAG
      TATGTCTTCG TCCCCGTTCC GGTTACCTGT ATAGTTTAAA TAGTTCTCGG TAAATTTTTA GACTTTTGTC

8331  GAAAATATGC AAGAATGAGG GGTGCCCACA CTAATGATGT AAAACAATTA ACAGAGGCAG TGCAAAAAAT
      CTTTTATACG TTCTTACTCC CCACGGGTGT GATTACTACA TTTTGTTAAT TGTCTCCGTC ACGTTTTTTA

8401  AACCACAGAA AGCATAGTAA TATGGGGAAA GACTCCTAAA TTTAAACTAC CCATACAAAA GGAAACATGG
      TTGGTGTCTT TCGTATCATT ATACCCCTTT CTGAGGATTT AAATTTGATG GGTATGTTTT CCTTTGTACC

8471  GAAACATGGT GGACAGAGTA TTGGCAAGCC ACCTGGATTC CTGAGTGGGA GTTTGTTAAT ACCCCTCCTT
      CTTTGTACCA CCTGTCTCAT AACCGTTCGG TGGACCTAAG GACTCACCCT CAAACAATTA TGGGGAGGAA

8541  TAGTGAAATT ATGGTACCAG TTAGAGAAAG AACCCATAGT AGGAGCAGAA ACCTTCTATG TAGATGGGGC
      ATCACTTTAA TACCATGGTC AATCTCTTTC TTGGGTATCA TCCTCGTCTT TGGAAGATAC ATCTACCCCG

8611  AGCTAACAGG GAGACTAAAT TAGGAAAAGC AGGATATGTT ACTAACAAAG GAAGACAAAA GGTTGTCCCC
      TCGATTGTCC CTCTGATTTA ATCCTTTTCG TCCTATACAA TGATTGTTTC CTTCTGTTTT CCAACAGGGG
```

FIG. 14U

8681 CTAACTAACA CAACAAATCA GAAAACTCAG TTACAAGCAA TTTATCTAGC TTTGCAGGAT TCAGGATTAG
GATTGATTGT GTTGTTTAGT CTTTTGAGTC AATGTTCGTT AAATAGATCG AAACGTCCTA AGTCCTAATC

8751 AAGTAAACAT AGTAACAGAC TCACAATATG CATTAGGAAT CATTCAAGCA CAACCAGATA AAAGTGAATC
TTCATTTGTA TCATTGTCTG AGTGTTATAC GTAATCCTTA GTAAGTTCGT GTTGGTCTAT TTTCACTTAG

8821 AGAGTTAGTC AATCAAATAA TAGAGCAGTT AATAAAAAAG GAAAAGGTCT ATCTGGCATG GGTACCAGCA
TCTCAATCAG TTAGTTTATT ATCTCGTCAA TTATTTTTTC CTTTTCCAGA TAGACCGTAC CCATGGTCGT

8891 CACAAAGGAA TTGGAGGAAA TGAACAAGTA GATAAATTAG TCAGTGCTGG AATCAGGAAA ATACTATTTT
GTGTTTCCTT AACCTCCTTT ACTTGTTCAT CTATTTAATC AGTCACGACC TTAGTCCTTT TATGATAAAA

8961 TAGATGGAAT AGATAAGGCC CAAGATGAAC ATTAGTTTTT ATGTCGACCT GCAGGGAAAG TTTTATAGGT
ATCTACCTTA TCTATTCCGG GTTCTACTTG TAATCAAAAA TACAGCTGGA CGTCCCTTTC AAAATATCCA

9031 AGTTGATAGA ACAAAATACA TAATTTTGTA AAAATAAATC ACTTTTTATA CTAATATGAC ACGATTACCA
TCAACTATCT TGTTTTATGT ATTAAAACAT TTTTATTTAG TGAAAAATAT GATTATACTG TGCTAATGGT

FIG. 14V

```
9101  ATACTTTTGT TACTAATATC ATTAGTATAC GCTACACCTT TTCCTCAGAC ATCTAAAAAA ATAGGTGATG
      TATGAAAACA ATGATTATAG TAATCATATG CGATGTGGAA AAGGAGTCTG TAGATTTTTT TATCCACTAC

9171  ATGCAACTTT ATCATGTAAT CGAAATAATA CAAATGACTA CGTTGTTATG AGTGCTTGGT ATAAGGAGCC
      TACGTTGAAA TAGTACATTA GCTTTATTAT GTTTACTGAT GCAACAATAC TCACGAACCA TATTCCTCGG

9241  CAATTCCATT ATTCTTTTAG CTGCTAAAAG CGACGTCTTG TATTTTGATA ATTATACCAA GGATAAAATA
      GTTAAGGTAA TAAGAAAATC GACGATTTTC GCTGCAGAAC ATAAAACTAT TAATATGGTT CCTATTTTAT

9311  TCTTACGACT CTCCATACGA TGATCTAGTT ACAACTATCA CAATTAAATC ATTGACTGCT AGAGATGCCG
      AGAATGCTGA GAGGTATGCT ACTAGATCAA TGTTGATAGT GTTAATTTAG TAACTGACGA TCTCTACGGC

9381  GTACTTATGT ATGTGCATTC TTTATGACAT CGCCTACAAA TGACACTGAT AAAGTAGATT ATGAAGAATA
      CATGAATACA TACACGTAAG AAATACTGTA GCGGATGTTT ACTGTGACTA TTTCATCTAA TACTTCTTAT

9451  CTCCACAGAG TTGATTGTAA ATACAGATAG TGAATCGACT ATAGACATAA TACTATCTGG ATCTACACAT
      GAGGTGTCTC AACTAACATT TATGTCTATC ACTTAGCTGA TATCTGTATT ATGATAGACC TAGATGTGTA
```

FIG. 14W

```
9521  TCACCAGAAA CTAGTTAAGC TTGTCTCCCT ATAGTGAGTC GTATTAGAGC TTGGCGTAAT CATGGTCATA
      AGTGGTCTTT GATCAATTCG AACAGAGGGA TATCACTCAG CATAATCTCG AACCGCATTA GTACCAGTAT

9591  GCTGTTTCCT GTGTGAAATT GTTATCCGCT CACAATTCCA CACAACATAC GAGCCGGAAG CATAAAGTGT
      CGACAAAGGA CACACTTTAA CAATAGGCGA GTGTTAAGGT GTGTTGTATG CTCGGCCTTC GTATTTCACA

9661  AAAGCCTGGG GTGCCTAATG AGTGAGCTAA CTCACATTAA TTGCGTTGCG CTCACTGCCC GCTTTCGAGT
      TTTCGGACCC CACGGATTAC TCACTCGATT GAGTGTAATT AACGCAACGC GAGTGACGGG CGAAAGCTCA

9731  CGGGAAACCT GTCGTGCCAG CTGCATTAAT GAATCGGCCA ACGCGCGGGG AGAGGCGGTT TGCGTATTGG
      GCCCTTTGGA CAGCACGGTC GACGTAATTA CTTAGCCGGT TGCGCGCCCC TCTCCGCCAA ACGCATAACC

9801  GCGCTCTTCC GCTTCCTCGC TCACTGACTC GCTGCGCTCG GTCGTTCGGC TGCGGCGAGC GGTATCAGCT
      CGCGAGAAGG CGAAGGAGCG AGTGACTGAG CGACGCGAGC CAGCAAGCCG ACGCCGCTCG CCATAGTCGA

9871  CACTCAAAGG CGGTAATACG GTTATCCACA GAATCAGGGG ATAACGCAGG AAAGAACATG TGAGCAAAAG
      GTGAGTTTCC GCCATTATGC CAATAGGTGT CTTAGTCCCC TATTGCGTCC TTTCTTGTAC ACTCGTTTTC

9941  GCCAGCAAAA GGCCAGGAAC CGTAAAAAGG CCGCGTTGCT GGCGTTTTTC GATAGGCTCC GCCCCCCTGA
      CGGTCGTTTT CCGGTCCTTG GCATTTTTCC GGCGCAACGA CCGCAAAAAG CTATCCGAGG CGGGGGGACT
```

FIG. 14X

```
10011  CGAGCATCAC AAAAATCGAC GCTCAAGTCA GAGGTGGCGA AACCCGACAG GACTATAAAG ATACCAGGCG
       GCTCGTAGTG TTTTTAGCTG CGAGTTCAGT CTCCACCGCT TTGGGCTGTC CTGATATTTC TATGGTCCGC

10081  TTTCCCCCTG GAAGCTCCCT CGTGCGCTCT CCTGTTCCGA CCCTGCCGCT TACCGGATAC CTGTCCGCCT
       AAAGGGGGAC CTTCGAGGGA GCACGCGAGA GGACAAGGCT GGGACGGCGA ATGGCCTATG GACAGGCGGA

10151  TTCTCCCTTC GGGAAGCGTG GCGCTTTCTC ATAGCTCACG CTGTAGGTAT CTCAGTTCGG TGTAGGTCGT
       AAGAGGGAAG CCCTTCGCAC CGCGAAAGAG TATCGAGTGC GACATCCATA GAGTCAAGCC ACATCCAGCA

10221  TCGCTCCAAG CTGGGCTGTG TGCACGAACC CCCCGTTCAG CCCGACCGCT GCGCCTTATC CGGTAACTAT
       AGCGAGGTTC GACCCGACAC ACGTGCTTGG GGGGCAAGTC GGGCTGGCGA CGCGGAATAG GCCATTGATA

10291  CGTCTTGAGT CCAACCCGGT AAGACACGAC TTATCGCCAC TGGCAGCAGC CACTGGTAAC AGGATTAGCA
       GCAGAACTCA GGTTGGGCCA TTCTGTGCTG AATAGCGGTG ACCGTCGTCG GTGACCATTG TCCTAATCGT

10361  GAGCGAGGTA TGTAGGCGGT GCTACAGAGT TCTTGAAGTG GTGGCCTAAC TACGGCTACA CTAGAAGGAC
       CTCGCTCCAT ACATCCGCCA CGATGTCTCA AGAACTTCAC CACCGGATTG ATGCCGATGT GATCTTCCTG

10431  AGTATTTGGT ATCTGCGCTC TGCTGAAGCC AGTTACCTTC GGAAAAAGAG TTGGTAGCTC TTGATCCGGC
       TCATAAACCA TAGACGCGAG ACGACTTCGG TCAATGGAAG CCTTTTTCTC AACCATCGAG AACTAGGCCG
```

FIG. 14Y

```
10501  AAACAAACCA CCGCTGGTAG CGGTGGTTTT TTTGTTTGCA AGCAGCAGAT TACGCGCAGA AAAAAAGGAT
       TTTGTTTGGT GGCGACCATC GCCACCAAAA AAACAAACGT TCGTCGTCTA ATGCGCGTCT TTTTTTCCTA

10571  CTCAAGAAGA TCCTTTGATC TTTTCTACGG GGTCTGACGC TCAGTGGAAC GAAAACTCAC GTTAAGGGAT
       GAGTTCTTCT AGGAAACTAG AAAAGATGCC CCAGACTGCG AGTCACCTTG CTTTTGAGTG CAATTCCCTA

10641  TTTGGTCATG AGATTATCAA AAAGGATCTT CACCTAGATC CTTTTAAATT AAAAATGAAG TTTTAAATCA
       AAACCAGTAC TCTAATAGTT TTTCCTAGAA GTGGATCTAG GAAAATTTAA TTTTTACTTC AAAATTTAGT

10711  ATCTAAAGTA TATATGAGTA AACTTGGTCT GACAGTTACC AATGCTTAAT CAGTGAGGCA CCTATCTCAG
       TAGATTTCAT ATATACTCAT TTGAACCAGA CTGTCAATGG TTACGAATTA GTCACTCCGT GGATAGAGTC

10781  CGATCTGTCT ATTTCGTTCA TCCATAGTTG CCTGACTCCC CGTCGTGTAG ATAACTACGA TACGGGAGGG
       GCTAGACAGA TAAAGCAAGT AGGTATCAAC GGACTGAGGG GCAGCACATC TATTGATGCT ATGCCCTCCC

10851  CTTACCATCT GGCCCCAGTG CTGCAATGAT ACCGCGAGAC CCACGCTCAC CGGCTCCAGA TTTATCAGCA
       GAATGGTAGA CCGGGGTCAC GACGTTACTA TGGCGCTCTG GGTGCGAGTG GCCGAGGTCT AAATAGTCGT

10921  ATAAACCAGC CAGCCGGAAG GGCCGAGCGC AGAAGTGGTC CTGCAACTTT ATCCGCCTCC ATCCAGTCTA
       TATTTGGTCG GTCGGCCTTC CCGGCTCGCG TCTTCACCAG GACGTTGAAA TAGGCGGAGG TAGGTCAGAT
```

FIG. 14Z

```
10991  TTAATTGTTG CCGGGAAGCT AGAGTAAGTA GTTCGCCAGT TAATAGTTTG CGCAACGTTG TTGGCATTGC
       AATTAACAAC GGCCCTTCGA TCTCATTCAT CAAGCGGTCA ATTATCAAAC GCGTTGCAAC AACCGTAACG

11061  TACAGGCATC GTGGTGTCAC GCTCGTCGTT TGGTATGGCT TCATTCAGCT CCGGTTCCCA ACGATCAAGG
       ATGTCCGTAG CACCACAGTG CGAGCAGCAA ACCATACCGA AGTAAGTCGA GGCCAAGGGT TGCTAGTTCC

11131  CGAGTTACAT GATCCCCCAT GTTGTGCAAA AAAGCGGTTA GCTCCTTCGG TCCTCCGATC GTTGTCAGAA
       GCTCAATGTA CTAGGGGGTA CAACACGTTT TTTCGCCAAT CGAGGAAGCC AGGAGGCTAG CAACAGTCTT

11201  GTAAGTTGGC CGCAGTGTTA TCACTCATGG TTATGGCAGC ACTGCATAAT TCTCTTACTG TCATGCCATC
       CATTCAACCG GCGTCACAAT AGTGAGTACC AATACCGTCG TGACGTATTA AGAGAATGAC AGTACGGTAG

11271  CGTAAGATGC TTTTCTGTGA CTGGTGAGTA CTCAACCAAG TCATTCTGAG AATAGTGTAT GCGGCGACCG
       GCATTCTACG AAAAGACACT GACCACTCAT GAGTTGGTTC AGTAAGACTC TTATCACATA CGCCGCTGGC

11341  AGTTGCTCTT GCCCGGCGTC AATACGGGAT AATACCGCGC CACATAGCAG AACTTTAAAA GTGCTCATCA
       TCAACGAGAA CGGGCCGCAG TTATGCCCTA TTATGGCGCG GTGTATCGTC TTGAAATTTT CACGAGTAGT
```

FIG. 14AA

```
11411  TTGGAAAACG TTCTTCGGGG CGAAAACTCT CAAGGATCTT ACCGCTGTTG AGATCCAGTT CGATGTAACC
       AACCTTTTGC AAGAAGCCCC GCTTTTGAGA GTTCCTAGAA TGGCGACAAC TCTAGGTCAA GCTACATTGG

11481  CACTCGTGCA CCCAACTGAT CTTCAGCATC TTTTACTTTC ACCAGCGTTT CTGGGTGAGC AAAAACAGGA
       GTGAGCACGT GGGTTGACTA GAAGTCGTAG AAAATGAAAG TGGTCGCAAA GACCCACTCG TTTTTGTCCT

11551  AGGCAAAATG CCGCAAAAAA GGGAATAAGG GCGACACGGA AATGTTGAAT ACTCATACTC TTCCTTTTTC
       TCCGTTTTAC GGCGTTTTTT CCCTTATTCC CGCTGTGCCT TTACAACTTA TGAGTATGAG AAGGAAAAAG

11621  AATATTATTG AAGCATTTAT CAGGGTTATT GTCTCATGAG CGGATACATA TTTGAATGTA TTTAGAAAAA
       TTATAATAAC TTCGTAAATA GTCCCAATAA CAGAGTACTC GCCTATGTAT AAACTTACAT AAATCTTTTT

11691  TAAACAAATA GGGGTTCCGC GCACATTTCC CCGAAAAGTG CCACCTGACG TCTAAGAAAC CATTATTATC
       ATTTGTTTAT CCCCAAGGCG CGTGTAAAGG GGCTTTTCAC GGTGGACTGC AGATTCTTTG GTAATAATAG

11761  ATGACATTAA CCTATAAAAA TAGGCGTATC ACGAGGCCCT TTCGTCTCGC GCGTTTCGGT GATGACGGTG
       TACTGTAATT GGATATTTTT ATCCGCATAG TGCTCCGGGA AAGCAGAGCG CGCAAAGCCA CTACTGCCAC
```

FIG. 14AB

```
11831  AAAACCTCTG ACACATGCAG CTCCCGGAGA CGGTCACAGC TTGTCTGTAA GCGGATGCCG GGAGCAGACA
       TTTTGGAGAC TGTGTACGTC GAGGGCCTCT GCCAGTGTCG AACAGACATT CGCCTACGGC CCTCGTCTGT

11901  AGCCCGTCAG GGCGCGTCAG CGGGTGTTGG CGGGTGTCGG GGCTGGCTTA ACTATGCGGC ATCAGAGCAG
       TCGGGCAGTC CCGCGCAGTC GCCCACAACC GCCCACAGCC CCGACCGAAT TGATACGCCG TAGTCTCGTC

11971  ATTGTACTGA GAGTGCACCA TATGCGGTGT GAAATACCGC ACAGATGCGT AAGGAGAAAA TACCGCATCA
       TAACATGACT CTCACGTGGT ATACGCCACA CTTTATGGCG TGTCTACGCA TTCCTCTTTT ATGGCGTAGT

12041  GGCGCCATTC GCCATTCAGG CTGCGCAACT GTTGGGAAGG GCGATCGGTG CGGGCCTCTT CGCTATTACG
       CCGCGGTAAG CGGTAAGTCC GACGCGTTGA CAACCCTTCC CGCTAGCCAC GCCCGGAGAA GCGATAATGC

12111  CCAGCTGGCG AAAGGGGGAT GTGCTGCAAG GCGATTAAGT TGGGTAACGC CAGGGTTTTC CCAGTCACGA
       GGTCGACCGC TTTCCCCCTA CACGACGTTC CGCTAATTCA ACCCATTGCG GTCCCAAAAG GGTCAGTGCT

12181  CGTTGTAAAA CGACGGCCAG TGAATTGGAT TTAGGTGACA CTATA
       GCAACATTTT GCTGCCGGTC ACTTAACCTA AATCCACTGT GATAT
```

FIG. 14AC

Text File of pLW-48 and the Included Individual HIV Genes and Their Promoters

Entire pLW-48 plasmid sequence:

GAATTCGTTGGTGGTCGCCATGGATGGTGTTATTGTATACTGTCTAAACGCG
TTAGTAAAACATGGCGAGGAAATAAATCATATAAAAAATGATTTCATGATTAA
ACCATGTTGTGAAAAAGTCAAGAACGTTCACATTGGCGGACAATCTAAAAAC
AATACAGTGATTGCAGATTTGCCATATATGGATAATGCGGTATCCGATGTAT
GCAATTCACTGTATAAAAAGAATGTATCAAGAATATCCAGATTTGCTAATTTG
ATAAAGATAGATGACGATGACAAGACTCCTACTGGTGTATATAATTATTTTAA
ACCTAAAGATGCCATTCCTGTTATTATATCCATAGGAAAGGATAGAGATGTTT
GTGAACTATTAATCTCATCTGATAAAGCGTGTGCGTGTATAGAGTTAAATTCA
TATAAAGTAGCCATTCTTCCCATGGATGTTTCCTTTTTTACCAAAGGAAATGC
ATCATTGATTATTCTCCTGTTTGATTTCTCTATCGATGCGGCACCTCTCTTAA
GAAGTGTAACCGATAATAATGTTATTATATCTAGACACCAGCGTCTACATGA
CGAGCTTCCGAGTTCCAATTGGTTCAAGTTTTACATAAGTATAAAGTCCGAC
TATTGTTCTATATTATATATGGTTGTTGATGGATCTGTGATGCATGCAATAGC
TGATAATAGAACTTACGCAAATATTAGCAAAAATATATTAGACAATACTACAA
TTAACGATGAGTGTAGATGCTGTTATTTTGAACCACAGATTAGGATTCTTGAT
AGAGATGAGATGCTCAATGGATCATCGTGTGATATGAACAGACATTGTATTA
TGATGAATTTACCTGATGTAGGCGAATTTGGATCTAGTATGTTGGGGAAATA
TGAACCTGACATGATTAAGATTGCTCTTTCGGTGGCTGGGTACCAGGCGCG
CCTTTCATTTTGTTTTTTTCTATGCTATAAATGGTACGTCCTGTAGAAACCCC
AACCCGTGAAATCAAAAAACTCGACGGCCTGTGGGCATTCAGTCTGGATCG
CGAAAACTGTGGAATTGATCAGCGTTGGTGGGAAAGCGCGTTACAAGAAAG
CCGGGCAATTGCTGTGCCAGGCAGTTTTAACGATCAGTTCGCCGATGCAGA
TATTCGTAATTATGCGGGCAACGTCTGGTATCAGCGCGAAGTCTTTATACCG
AAAGGTTGGGCAGGCCAGCGTATCGTGCTGCGTTTCGATGCGGTCACTCAT
TACGGCAAAGTGTGGGTCAATAATCAGGAAGTGATGGAGCATCAGGGCGG
CTATACGCCATTTGAAGCCGATGTCACGCCGTATGTTATTGCCGGGAAAAG
TGTACGTATCACCGTTTGTGTGAACAACGAACTGAACTGGCAGACTATCCC
GCCGGGAATGGTGATTACCGACGAAAACGGCAAGAAAAAGCAGTCTTACTT
CCATGATTTCTTTAACTATGCCGGAATCCATCGCAGCGTAATGCTCTACACC
ACGCCGAACACCTGGGTGGACGATATCACCGTGGTGACGCATGTCGCGCA
AGACTGTAACCACGCGTCTGTTGACTGGCAGGTGGTGGCCAATGGTGATGT
CAGCGTTGAACTGCGTGATGCGGATCAACAGGTGGTTGCAACTGGACAAG
GCACTAGCGGGACTTTGCAAGTGGTGAATCCGCACCTCTGGCAACCGGGT
GAAGGTTATCTCTATGAACTGTGCGTCACAGCCAAAAGCCAGACAGAGTGT
GATATCTACCCGCTTCGCGTCGGCATCCGGTCAGTGGCAGTGAAGGGCGA
ACAGTTCCTGATTAACCACAAACCGTTCTACTTTACTGGCTTTGGTCGTCAT
GAAGATGCGGACTTGCGTGGCAAAGGATTCGATAACGTGCTGATGGTGCAC
GACCACGCATTAATGGACTGGATTGGGGCCAACTCCTACCGTACCTCGCAT
TACCCTTACGCTGAAGAGATGCTCGACTGGGCAGATGAACATGGCATCGTG

FIG. 15A

GTGATTGATGAAACTGCTGCTGTCGGCTTTAACCTCTCTTTAGGCATTGGTT
TCGAAGCGGGCAACAAGCCGAAAGAACTGTACAGCGAAGAGGCAGTCAAC
GGGGAAACTCAGCAAGCGCACTTACAGGCGATTAAAGAGCTGATAGCGCGT
GACAAAAACCACCCAAGCGTGGTGATGTGGAGTATTGCCAACGAACCGGAT
ACCCGTCCGCAAGGTGCACGGGAATATTTCGCGCCACTGGCGGAAGCAAC
GCGTAAACTCGACCCGACGCGTCCGATCACCTGCGTCAATGTAATGTTCTG
CGACGCTCACACCGATACCATCAGCGATCTCTTTGATGTGCTGTGCCTGAA
CCGTTATTACGGATGGTATGTCCAAAGCGGCGATTTGGAAACGGCAGAGAA
GGTACTGGAAAAAGAACTTCTGGCCTGGCAGGAGAAACTGCATCAGCCGAT
TATCATCACCGAATACGGCGTGGATACGTTAGCCGGGCTGCACTCAATGTA
CACCGACATGTGGAGTGAAGAGTATCAGTGTGCATGGCTGGATATGTATCA
CCGCGTCTTTGATCGCGTCAGCGCCGTCGTCGGTGAACAGGTATGGAATTT
CGCCGATTTTGCGACCTCGCAAGGCATATTGCGCGTTGGCGGTAACAAGAA
AGGGATCTTCACTCGCGACCGCAAACCGAAGTCGGCGGCTTTTCTGCTGCA
AAAACGCTGGACTGGCATGAACTTCGGTGAAAAACCGCAGCAGGGAGGCA
AACAATGAGAGCTCGGTTGTTGATGGATCTGTGATGCATGCAATAGCTGATA
ATAGAACTTACGCAAATATTAGCAAAAATATATTAGACAATACTACAATTAAC
GATGAGTGTAGATGCTGTTATTTTGAACCACAGATTAGGATTCTTGATAGAG
ATGAGATGCTCAATGGATCATCGTGTGATATGAACAGACATTGTATTATGAT
GAATTTACCTGATGTAGGCGAATTTGGATCTAGTATGTTGGGGAAATATGAA
CCTGACATGATTAAGATTGCTCTTTCGGTGGCTGGCGGCCCGCTCGAGTAA
AAAATGAAAAAATATTCTAATTTATAGGACGGTTTTGATTTTCTTTTTTTCTAT
GCTATAAATAATAAATAGCGGCCGCACCATGAAAGTGAAGGGGATCAGGAA
GAATTATCAGCACTTGTGGAAATGGGGCATCATGCTCCTTGGGATGTTGATG
ATCTGTAGTGCTGTAGAAAATTTGTGGGTCACAGTTTATTATGGGGTACCTG
TGTGGAAAGAAGCAACCACCACTCTATTTTGTGCATCAGATGCTAAAGCATA
TGATACAGAGGTACATAATGTTTGGGCCACACATGCCTGTGTACCCACAGA
CCCCAACCCACAAGAAGTAGTATTGGAAAATGTGACAGAAAATTTTAACATG
TGGAAAAATAACATGGTAGAACAGATGCATGAGGATATAATCAGTTTATGGG
ATCAAAGCCTAAAGCCATGTGTAAAATTAACCCCACTCTGTGTTACTTTAAAT
TGCACTGATTTGAGGAATGTTACTAATATCAATAATAGTAGTGAGGGAATGA
GAGGAGAAATAAAAAACTGCTCTTTCAATATCACCACAAGCATAAGAGATAA
GGTGAAGAAAGACTATGCACTTTTcTATAGACTTGATGTAGTACCAATAGATA
ATGATAATACTAGCTATAGGTTGATAAATTGTAATACCTCAACCATTACACAG
GCCTGTCCAAAGGTATCCTTTGAGCCAATTCCCATACATTATTGTACCCCGG
CTGGTTTTGCGATTCTAAAGTGTAAAGACAAGAAGTTCAATGGAACAGGGCC
ATGTAAAAATGTCAGCACAGTACAATGTACACATGGAATTAGGCCAGTAGTG
TCAACTCAACTGCTGTTAAATGGCAGTCTAGCAGAAGAAGAGGTAGTAATTA
GATCTAGTAATTTCACAGACAATGCAAAAAACATAATAGTACAGTTGAAAGAA
TCTGTAGAAATTAATTGTACAAGACCCAACAACAATACAAGGAAAAGTATAC
ATATAGGACCAGGAAGAGCATTTTATACAACAGGAGAAATAATAGGAGATAT
AAGACAAGCACATTGCAACATTAGTAGAACAAAATGGAATAACACTTTAAAT
CAAATAGCTACAAAATTAAAAGAACAATTTGGGAATAATAAAACAATAGTCTT
TAATCAATCCTCAGGAGGGGACCCAGAAATTGTAATGCACAGTTTTAATTGT
GGAGGGGAATTCTTCTACTGTAATTCAACACAACTGTTTAATAGTACTTGGA
ATTTTAATGGTACTTGGAATTTAACACAATCGAATGGTACTGAAGGAAATGA

FIG. 15B

CACTATCACACTCCCATGTAGAATAAAACAAATTATAAATATGTGGCAGGAA
GTAGGAAAAGCAATGTATGCCCCTCCCATCAGAGGACAAATTAGATGCTCAT
CAAATATTACAGGGCTAATATTAACAAGAGATGGTGGAACTAACAGTAGTGG
GTCCGAGATCTTCAGACCTGGGGGAGGAGATATGAGGGACAATTGGAGAA
GTGAATTATATAAATATAAAGTAGTAAAAATTGAACCATTAGGAGTAGCACCC
ACCAAGGCAAAAAGAAGAGTGGTGCAGAGAGAAAAAAGAGCAGTGGGAAC
GATAGGAGCTATGTTCCTTGGGTTCTTGGGAGCAGCAGGAAGCACTATGGG
CGCAGCGTCAATAACGCTGACGGTACAGGCCAGACTATTATTGTCTGGTAT
AGTGCAACAGCAGAACAATTTGCTGAGGGCTATTGAGGCGCAACAGCATCT
GTTGCAACTCACAGTCTGGGGCATCAAGCAGCTCCAGGCAAGAGTCCTGG
CTGTGGAAAGATACCTAAGGGATCAACAGCTCCTAGGGATTTGGGGTTGCT
CTGGAAAACTCATCTGCACCACTGCTGTGCCTTGGAATGCTAGTTGGAGTA
ATAAAACTCTGGATATGATTTGGGATAACATGACCTGGATGGAGTGGGAAA
GAGAAATCGAAAATTACACAGGCTTAATATACACCTTAATTGAGGAATCGCA
GAACCAACAAGAAAAGAATGAACAAGACTTATTAGCATTAGATAAGTGGGCA
AGTTTGTGGAATTGGTTTGACATATCAAATTGGCTGTGGTATGTAAAAATCTT
CATAATGATAGTAGGAGGCTTGATAGGTTTAAGAATAGTTTTTACTGTACTTT
CTATAGTAAATAGAGTTAGGCAGGGATACTCACCATTGTCATTTCAGACCCA
CCTCCCAGCCCCGAGGGGACCCGACAGGCCCGAAGGAATCGAAGAAGAAG
GTGGAGACAGAGACTAATTTTTATGCGGCCGCTGGTACCCAACCTAAAAATT
GAAAATAAATACAAAGGTTCTTGAGGGTTGTGTTAAATTGAAAGCGAGAAAT
AATCATAAATAAGCCCGGGGATCCTCTAGAGTCGACACCATGGGTGCGAGA
GCGTCAGTATTAAGCGGGGGAGAATTAGATCGATGGGAAAAAATTCGGTTA
AGGCCAGGGGGAAAGAAAAAATATAAATTAAAACATATAGTATGGGCAAGCA
GGGAGCTAGAACGATTCGCAGTTAATCCTGGCCTGTTAGAAACATCAGAAG
GCTGTAGACAAATACTGGGACAGCTACAACCATCCCTTCAGACAGGATCAG
AAGAACTTAGATCATTATATAATACAGTAGCAACCCTCTATTGTGTGCATCAA
AGGATAGAGATAAAAGACACCAAGGAAGCTTTAGACAAGATAGAGGAAGAG
CAAAACAAAAGTAAGAAAAAAGCACAGCAAGCAGCAGCTGACACAGGACAC
AGCAATCAGGTCAGCCAAAATTACCCTATAGTGCAGAACATCCAGGGGCAA
ATGGTACATCAGGCCATATCACCTAGAACTTTAAATGCATGGGTAAAAGTAG
TAGAAGAGAAGGCTTTCAGCCCAGAAGTGATACCCATGTTTTCAGCATTATC
AGAAGGAGCCACCCCACAAGATTTAAACACCATGCTAAACACAGTGGGGGG
ACATCAAGCAGCCATGCAAATGTTAAAAGAGACCATCAATGAGGAAGCTGC
AGAATGGGATAGAGTGCATCCAGTGCATGCAGGGCCTATTGCACCAGGCCA
GATGAGAGAACCAAGGGGAAGTGACATAGCAGGAACTACTAGTACCCTTCA
GGAACAAATAGGATGGATGACAAATAATCCACCTATCCCAGTAGGAGAAATT
TATAAAAGATGGATAATCCTGGGATTAAATAAAATAGTAAGAATGTATAGCCC
TACCAGCATTCTGGACATAAGACAAGGACCAAAAGAACCCTTTAGAGACTAT
GTAGACCGGTTCTATAAAACTCTAAGAGCCGAGCAAGCTTCACAGGAGGTA
AAAAATTGGATGACAGAAACCTTGTTGGTCCAAAATGCGAACCCAGATTGTA
AGACTATTTTAAAAGCATTGGGACCAGCGGCTACACTAGAAGAAATGATGAC
AGCATGTCAGGGAGTAGGAGGACCCGGCCATAAGGCAAGAGTTTTGGCTG
AAGCAATGAGCCAAGTAACAAATTCAGCTACCATAATGATGCAGAGAGGCA
ATTTTAGGAACCAAAGAAAGATTGTTAAGTGTTTCAATTGTGGCAAAGAAGG
GCACACAGCCAGAAATTGCAGGGCCCCTAGGAAAAAGGGCTGTTGGAAAT

FIG. 15C

GTGGAAAGGAAGGACACCAAATGAAAGATTGTACTGAGAGACAGGCTAATT
TTTTAGGGAAGATCTGGCCTTCCTACAAGGGAAGGCCAGGGAATTTTCTTCA
GAGCAGACCAGAGCCAACAGCCCCACCAGAAGAGAGCTTCAGGTCTGGGG
TAGAGACAACAACTCCCCCTCAGAAGCAGGAGCCGATAGACAAGGAACTGT
ATCCTTTAACTTCCCTCAGATCACTCTTTGGCAACGACCCCTCGTCACAATA
AAGATAGGGGGGCAACTAAAGGAAGCTCTATTAGATACAGGAGCAGATGAT
ACAGTATTAGAAGAAATGAGTTTGCCAGGAAGATGGAAACCAAAAATGATAG
GGGGAATTGGAGGTTTTATCAAAGTAAGACAGTATGATCAGATACTCATAGA
AATCTGTGGACATAAAGCTATAGGTACAGTATTAGTAGGACCTACACCTGTC
AACATAATTGGAAGAAATCTGTTGACTCAGATTGGTTGCACTTTAAATTTTCC
CATTAGCCCTATTGAGACTGTACCAGTAAAATTAAAGCCAGGAATGGATGGC
CCAAAAGTTAAACAATGGCCATTGACAGAAGAAAAAATAAAAGCATTAGTAG
AAATTTGTACAGAAATGGAAAAGGAAGGGAAAATTTCAAAAATTGGGCCTGA
GAATCCATACAATACTCCAGTATTTGCCATAAAGAAAAAAGACAGTACTAAAT
GGAGGAAATTAGTAGATTTCAGAGAACTTAATAAGAGAACTCAAGACTTCTG
GGAAGTTCAATTAGGAATACCACATCCCGCAGGGTTAAAAAAGAAAAAATCA
GTAACAGTACTGGATGTGGGTGATGCATATTTTTCAGTTCCCTTAGATGAAG
ACTTCAGGAAGTATACTGCATTTACCATACCTAGTATAAACAATGAGACACC
AGGGATTAGATATCAGTACAATGTGCTTCCACAGGGATGGAAAGGATCACC
AGCAATATTCCAAAGTAGCATGACAAAAATCTTAGAGCCTTTTAAAAAACAAA
ATCCAGACATAGTTATCTATCAATACATGAACGATTTGTATGTAGGATCTGAC
TTAGAAATAGGGCAGCATAGAACAAAAATAGAGGAGCTGAGACAACATCTG
TTGAGGTGGGGACTTACCACACCAGACAAAAAACATCAGAAAGAACCTCCA
TTCCTTTGGATGGGTTATGAACTCCATCCTGATAAATGGACAGTACAGCCTA
TAGTGCTGCCAGAAAAAGACAGCTGGACTGTCAATGACATACAGAAGTTAG
TGGGGAAATTGAATACCGCAAGTCAGATTTACCCAGGGATTAAAGTAAGGC
AATTATGTAAACTCCTTAGAGGAACCAAAGCACTAACAGAAGTAATACCACT
AACAGAAGAAGCAGAGCTAGAACTGGCAGAAAACAGAGAGATTCTAAAAGA
ACCAGTACATGGAGTGTATTATGACCCATCAAAAGACTTAATAGCAGAAATA
CAGAAGCAGGGGCAAGGCCAATGGACATATCAAATTTATCAAGAGCCATTT
AAAAATCTGAAAACAGGAAAATATGCAAGAATGAGGGGTGCCCACACTAAT
GATGTAAAACAATTAACAGAGGCAGTGCAAAAAATAACCACAGAAAGCATAG
TAATATGGGGAAAGACTCCTAAATTTAAACTACCCATACAAAAGGAAACATG
GGAAACATGGTGGACAGAGTATTGGCAAGCCACCTGGATTCCTGAGTGGGA
GTTTGTTAATACCCCTCCTTTAGTGAAATTATGGTACCAGTTAGAGAAAGAA
CCCATAGTAGGAGCAGAAACCTTCTATGTAGATGGGGCAGCTAACAGGGAG
ACTAAATTAGGAAAAGCAGGATATGTTACTAACAAAGGAAGACAAAAGGTTG
TCCCCCTAACTAACACAACAAATCAGAAAACTCAGTTACAAGCAATTTATCTA
GCTTTGCAGGATTCAGGATTAGAAGTAAACATAGTAACAGACTCACAATATG
CATTAGGAATCATTCAAGCACAACCAGATAAAAGTGAATCAGAGTTAGTCAA
TCAAATAATAGAGCAGTTAATAAAAAAGGAAAAGGTCTATCTGGCATGGGTA
CCAGCACACAAAGGAATTGGAGGAAATGAACAAGTAGATAAATTAGTCAGT
GCTGGAATCAGGAAAATACTATTTTTAGATGGAATAGATAAGGCCCAAGATG
AACATTAGTTTTTATGTCGACCTGCAGGGAAAGTTTTATAGGTAGTTGATAG
AACAAAATACATAATTTTGTAAAAATAAATCACTTTTTATACTAATATGACACG
ATTACCAATACTTTTGTTACTAATATCATTAGTATACGCTACACCTTTTCCTCA

FIG. 15D

GACATCTAAAAAAATAGGTGATGATGCAACTTTATCATGTAATCGAAATAATA
CAAATGACTACGTTGTTATGAGTGCTTGGTATAAGGAGCCCAATTCCATTAT
TCTTTTAGCTGCTAAAAGCGACGTCTTGTATTTTGATAATTATACCAAGGATA
AAATATCTTACGACTCTCCATACGATGATCTAGTTACAACTATCACAATTAAA
TCATTGACTGCTAGAGATGCCGGTACTTATGTATGTGCATTCTTTATGACATC
GCCTACAAATGACACTGATAAAGTAGATTATGAAGAATACTCCACAGAGTTG
ATTGTAAATACAGATAGTGAATCGACTATAGACATAATACTATCTGGATCTAC
ACATTCACCAGAAACTAGTTAAGCTTGTCTCCCTATAGTGAGTCGTATTAGA
GCTTGGCGTAATCATGGTCATAGCTGTTTCCTGTGTGAAATTGTTATCCGCT
CACAATTCCACACAACATACGAGCCGGAAGCATAAAGTGTAAAGCCTGGGG
TGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCT
TTCGAGTCGGGAAACCTGTCGTGCCAGCTGCATTAATGAATCGGCCAACGC
GCGGGGAGAGGCGGTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGCTCAC
TGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACT
CAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGA
ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCG
TTGCTGGCGTTTTTCGATAGGCTCCGCCCCCCTGACGAGCATCACAAAAAT
CGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAG
GCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCG
CTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCT
CATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCTCCAAG
CTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC
CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACT
GGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTG
CTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAG
TATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGG
TAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTT
TGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTG
ATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGG
ATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTA
AAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACA
GTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTCG
TTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG
GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCA
CCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCG
CAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGC
CGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTT
GGCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCA
TTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGT
GCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGT
TGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTAC
TGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAG
TCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCA
ATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTG
GAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGAT
CCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTAC

FIG. 15E

TTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAA
AAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTT
CAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATT
TGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGA
AAAGTGCCACCTGACGTCTAAGAAACCATTATTATCATGACATTAACCTATAA
AAATAGGCGTATCACGAGGCCCTTTCGTCTCGCGCGTTTCGGTGATGACGG
TGAAAACCTCTGACACATGCAGCTCCCGGAGACGGTCACAGCTTGTCTGTA
AGCGGATGCCGGGAGCAGACAAGCCCGTCAGGGCGCGTCAGCGGGTGTT
GGCGGGTGTCGGGGCTGGCTTAACTATGCGGCATCAGAGCAGATTGTACT
GAGAGTGCACCATATGCGGTGTGAAATACCGCACAGATGCGTAAGGAGAAA
ATACCGCATCAGGCGCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGG
GCGATCGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGAT
GTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGAC
GTTGTAAAACGACGGCCAGTGAATTGGATTTAGGTGACACTATA

New Psyn II Promoter which controls ADA envelope expression:

TAAAAAATGAAAAAATATTCTAATTTATAGGACGGTTTTGATTTTCTTTTTTTC
TATGCTATAAATAATAAATA

ADA envelope truncated:

ATGAAAGTGAAGGGGATCAGGAAGAATTATCAGCACTTGTGGAAATGGGGC
ATCATGCTCCTTGGGATGTTGATGATCTGTAGTGCTGTAGAAAATTTGTGGG
TCACAGTTTATTATGGGGTACCTGTGTGGAAAGAAGCAACCACCACTCTATT
TTGTGCATCAGATGCTAAAGCATATGATACAGAGGTACATAATGTTTGGGCC
ACACATGCCTGTGTACCCACAGACCCCAACCCACAAGAAGTAGTATTGGAA
AATGTGACAGAAAATTTTAACATGTGGAAAAATAACATGGTAGAACAGATGC
ATGAGGATATAATCAGTTTATGGGATCAAAGCCTAAAGCCATGTGTAAAATT
AACCCCACTCTGTGTTACTTTAAATTGCACTGATTTGAGGAATGTTACTAATA
TCAATAATAGTAGTGAGGGAATGAGAGGAGAAATAAAAAACTGCTCTTTCAA
TATCACCACAAGCATAAGAGATAAGGTGAAGAAAGACTATGCACTTTTCTAT
AGACTTGATGTAGTACCAATAGATAATGATAATACTAGCTATAGGTTGATAAA
TTGTAATACCTCAACCATTACACAGGCCTGTCCAAAGGTATCCTTTGAGCCA
ATTCCCATACATTATTGTACCCCGGCTGGTTTTGCGATTCTAAAGTGTAAAG
ACAAGAAGTTCAATGGAACAGGGCCATGTAAAAATGTCAGCACAGTACAAT
GTACACATGGAATTAGGCCAGTAGTGTCAACTCAACTGCTGTTAAATGGCAG
TCTAGCAGAAGAAGAGGTAGTAATTAGATCTAGTAATTTCACAGACAATGCA
AAAAACATAATAGTACAGTTGAAAGAATCTGTAGAAATTAATTGTACAAGACC
CAACAACAATACAAGGAAAAGTATACATATAGGACCAGGAAGAGCATTTTAT
ACAACAGGAGAAATAATAGGAGATATAAGACAAGCACATTGCAACATTAGTA
GAACAAAATGGAATAACACTTTAAATCAAATAGCTACAAAATTAAAAGAACAA
TTTGGGAATAATAAAACAATAGTCTTTAATCAATCCTCAGGAGGGGACCCAG
AAATTGTAATGCACAGTTTTAATTGTGGAGGGGAATTCTTCTACTGTAATTCA
ACACAACTGTTTAATAGTACTTGGAATTTTAATGGTACTTGGAATTTAACACA

FIG. 15F

ATCGAATGGTACTGAAGGAAATGACACTATCACACTCCCATGTAGAATAAAA
CAAATTATAAATATGTGGCAGGAAGTAGGAAAAGCAATGTATGCCCCTCCCA
TCAGAGGACAAATTAGATGCTCATCAAATATTACAGGGCTAATATTAACAAG
AGATGGTGGAACTAACAGTAGTGGGTCCGAGATCTTCAGACCTGGGGGAG
GAGATATGAGGGACAATTGGAGAAGTGAATTATATAAATATAAAGTAGTAAA
AATTGAACCATTAGGAGTAGCACCCACCAAGGCAAAAAGAAGAGTGGTGCA
GAGAGAAAAAAGAGCAGTGGGAACGATAGGAGCTATGTTCCTTGGGTTCTT
GGGAGCAGCAGGAAGCACTATGGGCGCAGCGTCAATAACGCTGACGGTAC
AGGCCAGACTATTATTGTCTGGTATAGTGCAACAGCAGAACAATTTGCTGAG
GGCTATTGAGGCGCAACAGCATCTGTTGCAACTCACAGTCTGGGGCATCAA
GCAGCTCCAGGCAAGAGTCCTGGCTGTGGAAAGATACCTAAGGGATCAACA
GCTCCTAGGGATTTGGGGTTGCTCTGGAAAACTCATCTGCACCACTGCTGT
GCCTTGGAATGCTAGTTGGAGTAATAAAACTCTGGATATGATTTGGGATAAC
ATGACCTGGATGGAGTGGGAAAGAGAAATCGAAAATTACACAGGCTTAATAT
ACACCTTAATTGAGGAATCGCAGAACCAACAAGAAAAGAATGAACAAGACTT
ATTAGCATTAGATAAGTGGGCAAGTTTGTGGAATTGGTTTGACATATCAAATT
GGCTGTGGTATGTAAAAATCTTCATAATGATAGTAGGAGGCTTGATAGGTTT
AAGAATAGTTTTTACTGTACTTTCTATAGTAAATAGAGTTAGGCAGGGATACT
CACCATTGTCATTTCAGACCCACCTCCCAGCCCCGAGGGGACCCGACAGG
CCCGAAGGAATCGAAGAAGAAGGTGGAGACAGAGAC

PmH5 promoter (which controls HXB2 gag pol expression):

AAAAATTGAAAATAAATACAAAGGTTCTTGAGGGTTGTGTTAAATTGAAAGC
GAGAAATAATCATAAATA

HXB2 gag pol (with safety mutations, Δ integrase):

ATGGGTGCGAGAGCGTCAGTATTAAGCGGGGGAGAATTAGATCGATGGGA
AAAAATTCGGTTAAGGCCAGGGGGAAAGAAAAAATATAAATTAAAACATATA
GTATGGGCAAGCAGGGAGCTAGAACGATTCGCAGTTAATCCTGGCCTGTTA
GAAACATCAGAAGGCTGTAGACAAATACTGGGACAGCTACAACCATCCCTT
CAGACAGGATCAGAAGAACTTAGATCATTATATAATACAGTAGCAACCCTCT
ATTGTGTGCATCAAAGGATAGAGATAAAAGACACCAAGGAAGCTTTAGACAA
GATAGAGGAAGAGCAAAACAAAAGTAAGAAAAAAGCACAGCAAGCAGCAGC
TGACACAGGACACAGCAATCAGGTCAGCCAAAATTACCCTATAGTGCAGAA
CATCCAGGGGCAAATGGTACATCAGGCCATATCACCTAGAACTTTAAATGCA
TGGGTAAAAGTAGTAGAAGAGAAGGCTTTCAGCCCAGAAGTGATACCCATG
TTTTCAGCATTATCAGAAGGAGCCACCCCACAAGATTTAAACACCATGCTAA
ACACAGTGGGGGGACATCAAGCAGCCATGCAAATGTTAAAAGAGACCATCA
ATGAGGAAGCTGCAGAATGGGATAGAGTGCATCCAGTGCATGCAGGGCCT
ATTGCACCAGGCCAGATGAGAGAACCAAGGGGAAGTGACATAGCAGGAAC
TACTAGTACCCTTCAGGAACAAATAGGATGGATGACAAATAATCCACCTATC
CCAGTAGGAGAAATTTATAAAAGATGGATAATCCTGGGATTAAATAAAATAG
TAAGAATGTATAGCCCTACCAGCATTCTGGACATAAGACAAGGACCAAAAGA
ACCCTTTAGAGACTATGTAGACCGGTTCTATAAAACTCTAAGAGCCGAGCAA

FIG. 15G

GCTTCACAGGAGGTAAAAAATTGGATGACAGAAACCTTGTTGGTCCAAAATG
CGAACCCAGATTGTAAGACTATTTTAAAAGCATTGGGACCAGCGGCTACACT
AGAAGAAATGATGACAGCATGTCAGGGAGTAGGAGGACCCGGCCATAAGG
CAAGAGTTTTGGCTGAAGCAATGAGCCAAGTAACAAATTCAGCTACCATAAT
GATGCAGAGAGGCAATTTTAGGAACCAAAGAAAGATTGTTAAGTGTTTCAAT
TGTGGCAAAGAAGGGCACACAGCCAGAAATTGCAGGGCCCCTAGGAAAAA
GGGCTGTTGGAAATGTGGAAAGGAAGGACACCAAATGAAAGATTGTACTGA
GAGACAGGCTAATTTTTTTAGGGAAGATCTGGCCTTCCTACAAGGGAAGGCC
AGGGAATTTTCTTCAGAGCAGACCAGAGCCAACAGCCCCACCAGAAGAGAG
CTTCAGGTCTGGGGTAGAGACAACAACTCCCCCTCAGAAGCAGGAGCCGAT
AGACAAGGAACTGTATCCTTTAACTTCCCTCAGATCACTCTTTGGCAACGAC
CCCTCGTCACAATAAAGATAGGGGGGCAACTAAAGGAAGCTCTATTAGATA
CAGGAGCAGATGATACAGTATTAGAAGAAATGAGTTTGCCAGGAAGATGGA
AACCAAAAATGATAGGGGGAATTGGAGGTTTTATCAAAGTAAGACAGTATGA
TCAGATACTCATAGAAATCTGTGGACATAAAGCTATAGGTACAGTATTAGTA
GGACCTACACCTGTCAACATAATTGGAAGAAATCTGTTGACTCAGATTGGTT
GCACTTTAAATTTTCCCATTAGCCCTATTGAGACTGTACCAGTAAAATTAAAG
CCAGGAATGGATGGCCCAAAAGTTAAACAATGGCCATTGACAGAAGAAAAA
ATAAAAGCATTAGTAGAAATTTGTACAGAAATGGAAAAGGAAGGGAAAATTT
CAAAAATTGGGCCTGAGAATCCATACAATACTCCAGTATTTGCCATAAAGAA
AAAAGACAGTACTAAATGGAGGAAATTAGTAGATTTCAGAGAACTTAATAAG
AGAACTCAAGACTTCTGGGAAGTTCAATTAGGAATACCACATCCCGCAGGG
TTAAAAAAGAAAAAATCAGTAACAGTACTGGATGTGGGTGATGCATATTTTTC
AGTTCCCTTAGATGAAGACTTCAGGAAGTATACTGCATTTACCATACCTAGT
ATAAACAATGAGACACCAGGGATTAGATATCAGTACAATGTGCTTCCACAGG
GATGGAAAGGATCACCAGCAATATTCCAAAGTAGCATGACAAAAATCTTAGA
GCCTTTTAAAAAACAAAATCCAGACATAGTTATCTATCAATACATGAACGATT
TGTATGTAGGATCTGACTTAGAAATAGGGCAGCATAGAACAAAAATAGAGGA
GCTGAGACAACATCTGTTGAGGTGGGGACTTACCACACCAGACAAAAAACA
TCAGAAAGAACCTCCATTCCTTTGGATGGGTTATGAACTCCATCCTGATAAA
TGGACAGTACAGCCTATAGTGCTGCCAGAAAAAGACAGCTGGACTGTCAAT
GACATACAGAAGTTAGTGGGGAAATTGAATACCGCAAGTCAGATTTACCCA
GGGATTAAAGTAAGGCAATTATGTAAACTCCTTAGAGGAACCAAAGCACTAA
CAGAAGTAATACCACTAACAGAAGAAGCAGAGCTAGAACTGGCAGAAAACA
GAGAGATTCTAAAAGAACCAGTACATGGAGTGTATTATGACCCATCAAAAGA
CTTAATAGCAGAAATACAGAAGCAGGGGCAAGGCCAATGGACATATCAAAT
TTATCAAGAGCCATTTAAAAATCTGAAAACAGGAAAATATGCAAGAATGAGG
GGTGCCCACACTAATGATGTAAAACAATTAACAGAGGCAGTGCAAAAAATAA
CCACAGAAAGCATAGTAATATGGGGAAAGACTCCTAAATTTAAACTACCCAT
ACAAAAGGAAACATGGGAAACATGGTGGACAGAGTATTGGCAAGCCACCTG
GATTCCTGAGTGGGAGTTTGTTAATACCCCTCCTTTAGTGAAATTATGGTAC
CAGTTAGAGAAAGAACCCATAGTAGGAGCAGAAACCTTCTATGTAGATGGG
GCAGCTAACAGGGAGACTAAATTAGGAAAAGCAGGATATGTTACTAACAAA
GGAAGACAAAAGGTTGTCCCCCTAACTAACACAACAAATCAGAAAACTCAGT
TACAAGCAATTTATCTAGCTTTGCAGGATTCAGGATTAGAAGTAAACATAGTA
ACAGACTCACAATATGCATTAGGAATCATTCAAGCACAACCAGATAAAAGTG

FIG. 15H

AATCAGAGTTAGTCAATCAAATAATAGAGCAGTTAATAAAAAAGGAAAAGGT
CTATCTGGCATGGGTACCAGCACACAAAGGAATTGGAGGAAATGAACAAGT
AGATAAATTAGTCAGTGCTGGAATCAGGAAAATACTATTTTTAGATGGAATA
GATAAGGCCCAAGATGAACATTAG

FIG. 15I

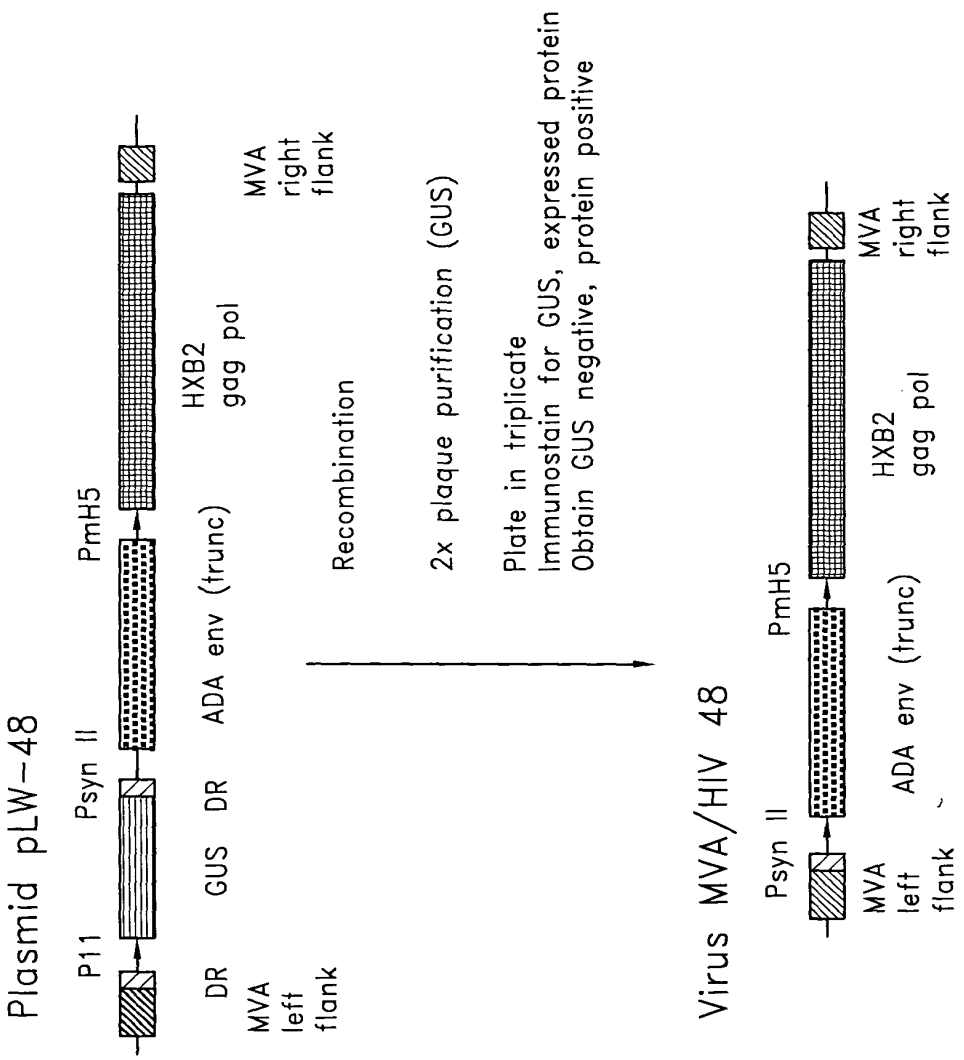
Plasmid pLW-48
P11
Psyn II
PmH5
DR
GUS
DR
ADA env (trunc)
HXB2
gag pol
MVA
left
flank
MVA
right
flank
Recombination
2x plaque purification (GUS)
Plate in triplicate
Immunostain for GUS, expressed protein
Obtain GUS negative, protein positive
Virus MVA/HIV 48
Psyn II
PmH5
MVA
left
flank
ADA env (trunc)
HXB2
gag pol
MVA
right
flank

FIG. 16

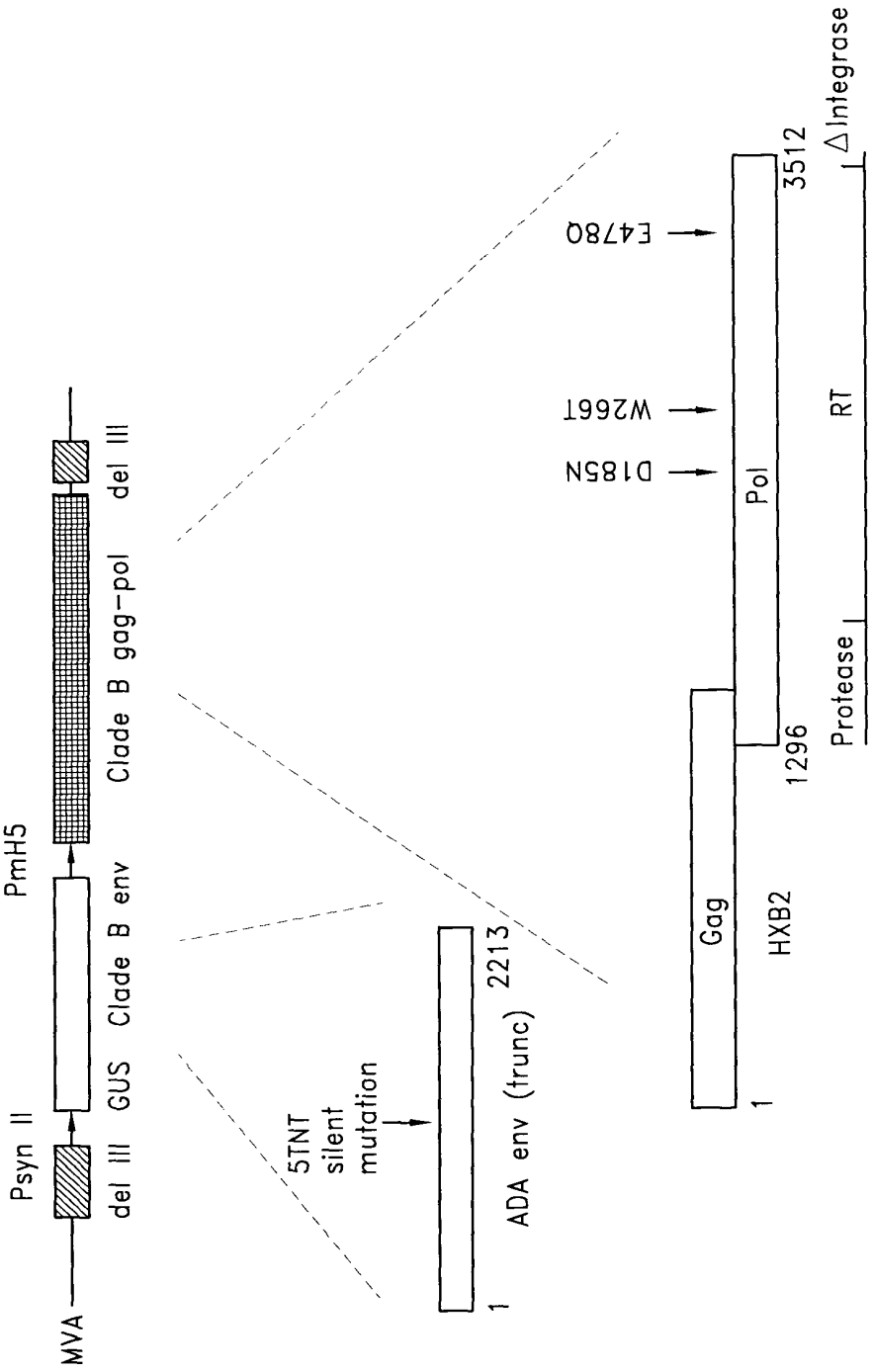
MVA
Psyn II
del III
GUS
PmH5
Clade B env
Clade B gag-pol
del III
5TNT
silent
mutation
1
ADA env (trunc)
2213
E478Q
W266T
D185N
Gag
Pol
HXB2
1
1296
3512
RT
Protease
ΔIntegrase

FIG. 17

Sequence of new Psyn II promoter:

Early part of promoter

Critical region Early start site

TAAAAAATGAAAAAATATTCTAATTTATAGGACGGT

Late part of promoter

TTTGATTTTCTTTTTTTCTATGCTATAAATAATAAATA

FIG. 18